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OUR COVER

Shows Al Penny, VK5ZC. More
details are given on page 15.

FEDERAL COMMENT



WHAT'S IN A NAME?

From his early beginnings the Amateur has been acclaimed for his ingenuity, inventiveness and will to experiment. He built his receiver, his transmitter and cut and erected his antennae. He built his own test gear and experimented with bread-board layouts before finally building his gear into its eventual chassis. Since the second world war, these activities have largely ceased. The commercial transmitter and receiver and even antenna is now commonplace in the Amateur's shack.

What are the reasons for this change in perspective? Is it due to the surfeit of Amateur commercial equipment on the market? Is it due to the Amateur now having less time on his hands to build new gear? Is it due to a flush economy in which it is cheaper to buy commercial than build Amateur? Is it due to the demands for more exacting standards in Amateur equipment brought about by large increases in the Amateur world population? Is it due to more complex and elaborate equipment requiring greater frequency stability and flexibility? Or is it due to just sheer laziness?

The only field perhaps that has not been so largely influenced by commercial equipment is in the u.h.f. and s.h.f. fields, although the inroads of commercialism in this part of the spectrum are also evident, particularly in the U.S.A. In any so styled analysis of this sort, one has to ask the obvious question—is this a good or bad state of affairs for the Amateur? In many ways, the availability of commercially made Amateur equipment is a good thing—it gives him more on-the-air time, he can treat his hobby more as a relaxation instead of labour and he now has a signal that is neither over-modulated or putting out an R.A.C. note. On the debit side, however, he is now less technically inclined, will probably have to send his equipment to the supplier if anything goes wrong and perhaps worst of all is losing his incentive to experiment and improve his gear.

This indictment of the Amateur's inventiveness and ingenuity is only a general and not an individual one for there are still quite a large percentage of Amateurs who still like to build their own equipment. New fields in Amateur communication have nearly all been due to the experimental work of devotees to the "old ways"—a good example being the building of the Oscar III, translator satellite transmitter of which we should hear a lot more in the coming months. One might also add, in fairness, that most Amateur commercial gear is built and tested by Amateurs for Amateurs. It would also be true to say that many of the Amateurs who have commercial gear today are those older members who have graduated from the old bread-board, now have less time for home construction and like to use Amateur Radio as a relaxation.

Despite the arguments for and against the use of commercial equipment, there is not quite anything to exceed the thrill of switching on the h.t. of the home-brew receiver and hearing that DX signal come in at S9 plus, or the equally glorious sight of the plate meter of the transmitter dipping to plus zero current before loading the "skywire". There is that inexplicable feeling and sense of grandeur of having created something that really works. We cannot do better than enjoin all newcomers to the Amateur ranks to pursue the old tradition in some small way and experience that sense of achievement which must be kept alive if we are to continue to call ourselves Amateurs.

FEDERAL EXECUTIVE, W.I.A.

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RE-WINDING TRANSFORMERS

IAN PHILLIPS*

PASSING examinations and being an Amateur are not good bedmates and when coupled with "student pauperism" some of the problems appear insuperable. Here is my answer to one insuperable problem, 300 volts at 500 mA. by re-winding burnt-out television power transformers. It cost me ten shillings for the purchase of the transformer and no more. The voltage doubler is almost unbeatable costwise (with re-winds) when coupled to silicon diodes, and it is on this basis these notes are formulated.



Often these transformers are to be had for the asking, or for a nominal fee. If you get the choice, take the largest one, or the heaviest one, as it will take more turns and handle more power than the smaller ones. In determining the amount of power it will handle, determine the core area, see Fig. 1, by multiplying 1.5" by the stack height and relate this to Fig. 2 to find its power handling capacity. Trying to take more will result in large losses and heating.

TAKING IT APART

When removing the cover plates take care with the leads as they may break off. Undo the bolts and put them somewhere where they won't get lost. Don't worry about the transformer falling to pieces, it won't. Then insert a knife between the top two laminations to break the "goo" holding them and

pull out using pliers. Take care not to bend them. Continue this until they are all out and put them away so that they will not get damaged.

Now the order of the windings and which is the damaged one must be determined. An ohm-meter is useful for this and typical readings are shown in Fig. 3. Tag them or otherwise identify the layers to save trouble later. The usual order of winding is, from the core out: primary, high tension and heaters.

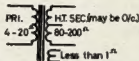


Fig. 3.

The winding that usually burns out is the high tension winding, and this can be seen by the layers of burnt paper. Try pulling on one of the burnt leads and wind the wire so obtained on to a spool. It may break and drastic surgery will be required to retrieve it. After a few layers of wire have been removed it should be possible to separate the primary and high tension wire from the outer windings and this should be done. Continue unwinding until all of the damaged winding is removed and carefully wound up. Then examine the primary to see if it also requires maintenance, it probably won't, but if it does follow the same procedure as for the h.t. winding, including the number of turns required.

URNS PER VOLT

Now take the outer windings and remove the protective paper. Several windings in heavy wire will be visible. These are the heater windings and you can use them to determine the turns per volt (t.p.v.) ratio. Carefully count the number of turns on one of these windings and record it. If it is a multiple of five, it is a 5-volt winding; of six, it is a 6-volt winding. Commonly the number of turns will be 10 or 12, but if you find 20 or 24, check again to see if the manufacturer has put two wires in parallel as is often done. If there are 10 or 12 turns, the

t.p.v. ratio is 2; 15 or 18, 3, etc. A common ratio is 2 t.p.v.

This leads to the number of turns that must now be put on the secondary if the t.p.v. ratio is 2, then we require 2 turns for every volt, thus for 150 volts you need 300 turns, and for 200 volts, 400 turns, etc.

WIRE TO BE USED

The gauge of the wire to be used is determined by the current required (see Table 1).

If you are lucky the salvaged h.t. winding will carry the current, either single or doubled. To find its gauge, compare it with known wires, or use a micrometer. If it will take the current, then you must start thinking about re-insulating it as the enamel may be badly burnt. If so, it must be enamelled, if not it can be used as is. The chance of a small bare patch coming against another can be insured against by treating as a joint.

First the burnt enamel should be scraped off by running the wire through a steel-wool pad, taking care not to kink it. It must then be run through a bath of thin enamel, allowed to dry and run through again. See Fig. 4 for a suggested method, although many others will suggest themselves.

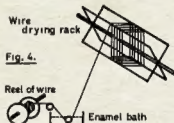


Fig. 4.

If you were unlucky and new wire has to be bought, the amount needed must be calculated. Measure the length of one turn around the primary and of one just inside the outer-winding, take an average and multiply by the number of turns required. This is the absolute minimum of wire required, so buy more.

Example, around the core, 10 inches; inside outer-winding, 16 inches.

$$\text{Average} = (10 + 16) \div 2 = 13 \text{ inches.}$$

$$\text{Inches required} = 13 \times 300 \text{ turns} = 3900 \text{ inches.}$$

$$\text{Feet required} = 325 \text{ feet.}$$

Now consult Table 1 for the weight of wire needed. Don't forget, if the wire is to be doubled, double the length. Inter-layer insulation is waxed lunch wrap and a supply should be cut up beforehand. When winding, go as near as possible to the edge in order to put the maximum number of turns on each layer. In my case I used No. 26 re-painted wire doubled and managed 46 turns on the first layer and about 38

Gauge B. & S.	Current Capacity (Amp.)	Turns per inch (Enamel)	Feet per lb. (Bare)
18	2.36	23.6	200
20	1.46	29.4	320
22	0.918	37.0	510
24	0.577	46.3	810
26	0.363	58.0	1300
28	0.228	72.7	2090
30	0.144	90.5	3280
32	0.090	113.0	5227

* May be increased 46%.

Table 1.

* 179 Abbott St., Sandringham, S.E., Victoria.

* This is an often used width for the core, but if you can determine the exact width, so much the better.

on the last. This was because of caution about going over close to the edges and was about the best possible.

Wind the wire on tightly, taping it slowly and note down the number of turns on each layer as each is completed, as to forget how many are on, is very trying to the patience.

After each layer is complete, place a strip of lunch-wrap over it and hold it in place with scotch tape. Wind all turns in the same direction (this is important).

The high voltage winding is the toughest job and will take a couple of hours. If so desired, taps could be brought out so that a choice of secondary voltages is available and it is suggested that this is done on the edges of the layers to avoid complications. If the wire breaks, don't panic but carefully solder it up and put the joint into an insulated package as shown in Fig. 5.

When the winding is complete wrap several layers of waxed paper around it for mechanical protection, then fit it back inside the outer windings and fix with several pieces of scotch tape (see Fig. 6).

RE-ASSEMBLING

Now the laminations have to be assembled and it is rather simple, just put one E-plate in from one side and one from the other, with the I-plates filling the gaps so left. Probably they won't all go back without extreme force, but don't worry, this small amount of iron will make no difference and to force them in will only damage the windings.

Put the bolts back in and tighten them up, leaving the cover plates off and the leads flying. Now it must be tested.

TESTING

To test, apply 6.3 volts from another transformer to one of the heater windings. If all voltages appear normal, then remove the 6.3v. and apply 240v. to the primary (use a fuse) and measure the voltages.

Turn off, pick up and drop the transformer about half an inch and repeat the tests. This is to check for intermittent faults. If all is still normal apply power for two hours and check from time to time for excessive heating. It will warn a bit through losses, but should not get hot. If this is OK, check the voltages again and if all is as it should be, final assembly may be done. If not—heartbreak—it will have to be dismantled and thoroughly checked.

Replace one of the cover-plates and bolt it up tight and prepare a terminal board as is shown in Fig. 7a and attach as shown in Fig. 7b.

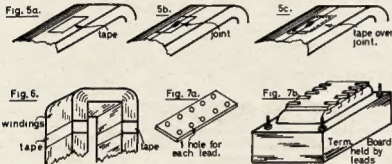
Thus you should have tailor-made volts and a knowledge of how to roll-your-own for almost nothing.

NOTE

Care should be taken when selecting the layer insulating paper, as some lunch wrapping papers soften with heat and could allow the tightly wound wire to cut through to the next layer, with consequent possible shorted turns.

Likewise some "sticky" tapes are hygroscopic, which can cause corrosion of winding wire if moisture is absorbed. This will result in open circuited turns, and more heartbreaks.

The above is not just academic interest, unfortunately, but the result of hard experience.—Editor.



DRIVING ZERO-BIAS 807s—VK4ZJB METHOD

J. D. BISGROVE,* VK4ZJB

UPON reading a previous article on this subject in "A.R." I was tempted to try methods myself. The results of this experiment have left nothing to be desired.

With the advent of t.v., several tubes capable of large audio power outputs have become available. Of these, the 6CM5 is very good in single ended or push pull work. Its plate impedance is 3,500 ohms normally, which is reasonably low and this is a desirable con-

dition. With 300 volts anode and 150 volts (maximum) screen, you can secure at least 8, and up to 12, watts of audio. This is a good figure to drive 807s in zero bias.

The grid-to-grid impedance of zero bias 807s is 14,500 ohms. A 522 mod. tranny, originally used with push-pull 12A6s, has an impedance ratio of 22,000 ohms p/p. to 5,000 ohms, used back-to-front, i.e. with 6CM5 plate fed through the 5,000 ohms secondary (which is now used as the primary). The 3,500 ohms plate impedance of the

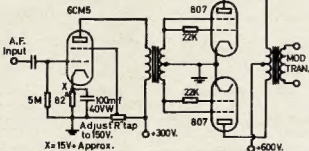
6CM5 reflects 15,400 ohms into the 807 grids—very close to 14,500 ohms and quite useable.

The modulator shown produces 100 watts of clean audio (r.m.s. value) into the 2,500 ohm load, which my transmitter presents.

At no time is the ex-SCR522 mod. transformer over-rated, in fact the primary (now), which was the secondary, previously handled more current than now. These transformers are easy to obtain and 6CM5s are cheap and load along here.

The amount of drive obtainable is adequate, in fact excess is available. A cheap and very effective 100 watts, and an easy answer to an old problem.

Although I tried triode connecting the 6CM5, and also negative feedback, I found that the 6CM5 behaves excellently as shown. Its low plate impedance is the good factor enabling such an effective and simple driver.



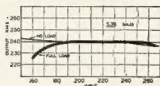
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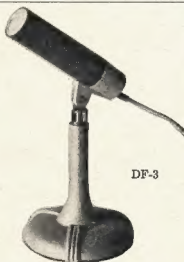
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Five Half-Waves in Phase on 144 Mc.*

A GAIN ANTENNA FOR TWO METRES

BYRON H. KRETZMAN, W2JTP

● On two metre mobile and f.m., the vertical antenna still holds the edge on popularity with its omnidirectional characteristics and simplicity. Add to this, though, a little omnidirectional gain on the order of 5 db. and the vertical begins to look even more enticing than ever.

IN case you didn't know it, not all 2 metre activity consists of DX-chasing, meteor scatter, contests, etc. In many areas, I'll grant you metropolitan and suburban for the most part, local and extended-local communication exists on a highly reliable day-in and day-out basis. Mobile operation, quite naturally, is a regular part of this activity. This harkens back to the days of the old 5 metre band where such v.h.f. operation began. As the result, Hamming in these areas becomes a much more personal thing; everyone soon gets to know everyone else. It becomes easy to round up a gang to help put up a tower or a beam for another band.

Keeping in mind that working mobiles is a requirement, you can see that vertical polarisation is a must. Secondly, those who have tried beams quickly realise that, in these centres of high activity, beams are impractical. Too much can be missed off the back end. An omnidirectional antenna characteristic therefore becomes an additional requirement.

Omnidirectional antennae for 2 metres usually fall into two classes: the ground-plane or the coaxial-type. Both of these normally provide no gain in performance over a reference half-wave doublet, with the possible exception of the stacked coax antenna. What we are searching for is a 2 metre antenna which is vertically polarised and which will give us a power gain in all directions. Bear in mind, too, any gain achieved in the antenna system also results in increased range of reception. And lastly, a high gain omnidirectional vertically polarised 2 metre antenna should be easy to construct at low cost. (This lets out the stacked coax unless you have the facilities of a machine shop available.)

THEORY

Gain in an omnidirectional vertically polarised v.h.f. antenna is realised basically by stacking half-wave elements, one above the other. The trick is to phase them properly and to feed them efficiently. This is nothing new. Twenty-five years ago this was called the "Franklin" antenna. Today a somewhat similar antenna is described in the A.R.R.L. Handbook.

* Reprinted from "CQ," March 1964.

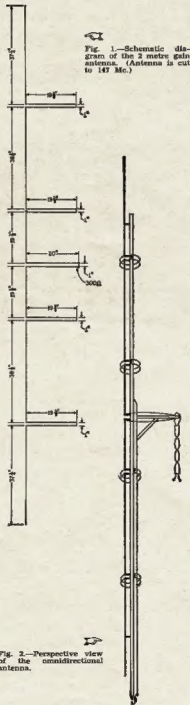


Fig. 1.—Schematic diagram of the 2 metre gain antenna. (Antenna is cut to 147 Mc.)

From page 703 of the 4th edition of "Reference Data for Radio Engineers" (I.T.T.), the gain of an omnidirectional stacked array is approximately equal to $2L/\lambda$ over the theoretical isotropic radiator, where L is the length. If we build an antenna of five half-waves in phase, the length, in terms of wave-length, is 2.5 λ . Putting this into the above formula, the power gain is then 2(2.5) or five times. Since a half-wave dipole is considered to have a gain of 1.64 times the isotropic radiator, the antenna will therefore have a power gain of 5/1.64 or 3.05. This, then, is an effective gain of 4.84 db.

A PRACTICAL ANTENNA

Fig. 1 shows the schematic diagram of our 2 metre "gain" antenna. As you can see, it consists of five half-waves in phase, one above the other. There are quarter-wave matching stubs in between each element, and the feed point is at the centre of the middle half-wave element. (Feeding this array in such a balanced manner is one of the tricks in getting efficient operation.) The antenna feeder is ordinary 300-ohm t.v. "twin-lead". (Horror!) This was done for several reasons. First of all it is low cost, as compared to coax. Secondly, its losses are less than ordinary coax; and, thirdly, because it is a mechanically simple balanced transmission line with readily available inexpensive (t.v.) supporting hardware.

Our antenna was cut to about 147 Mc., and like any co-linear array it is reasonably broad, having a low s.w.r. out to at least 1 Mc. either side of that frequency.

You could feed this antenna in the centre of the middle element directly with the 300-ohm twin-lead, that is if (Continued on next page)

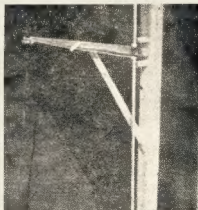


Fig. 2.—Perspective view of the omnidirectional antenna.

Centre feed arrangement showing how the linear matching transformer is twisted to enable the twin-lead feeder to drop straight down.

you don't mind a standing wave ratio of about 2:1. We did, so a quarter-wave linear matching transformer was installed at the feed point. The results were extremely gratifying. Its installation brought the s.w.r. down to 1.1:1.

Just one more point: Note that, in the interest of balance, the matching transformer is brought away from the feed point at a right angle; and, consequently, the twin-lead feeder is brought down at least a quarter-wave from the lower sections of the antenna thereby little affecting the feed impedance.

CONSTRUCTION

Our 2 metre gain antenna is built on wood. (Horror, again?) Using wood greatly simplifies construction and reduces cost. You can't buy 2 x 2's twenty-four feet long, but you can buy a 2 x 4 that long. Just a little sweet-talkin' to the lumber yard man and he will rip-saw it right down the middle for you. Of course you should get him to let you pick out a length as straight-grained and as free from knots as possible. Total cost? Less than \$3!

After you get your lumber home, select the half most free from knots for the top section. A few minutes work with a carpenter's plane on the corners will save you from splinters while you are handling the antenna. It's time well spent. The remaining half we sawed in two to make the bottom of the classical "A" frame of hamdom. You could gain another 12 feet or so of height if you were to splurge and buy another (ripped) 2 x 4. We didn't.

The antenna elements themselves we recommend be made of aluminium to keep down the weight. We found some 3/16" solid rod in surplus, but almost any kind of aluminium rod or tubing up to about 3/8" in diameter can be used. Old discarded t.v. antenna elements, for instance. Another good possibility is No. 8 or 10 aluminium clothes line wire. (This hard-drawn wire is stiff compared to the bare aluminium "ground wire" sold in t.v. parts stores.) Since we used the relatively stiff solid rod, only two ceramic one-inch high stand-off insulators were used with each element. The element was fastened to each insulator with nylon cable clamps, available in parts stores for pennies.

No doubt you have noticed that the quarter-wave matching stubs between each element have been curved around and have had their "shorting bars" screwed down directly to the wood mast. (Horror, thrice!) Well, curving around these stubs makes the whole array lots easier to handle than if they were sticking straight out. No difference in performance was discernible when they were curved back, by the way.

The actual stubs were made of a continuous piece of No. 14 wire, so there were no mechanical problems with a "shorting bar". Spacing was 1", and three spreaders made from 1/2" diameter plastic rod were slipped on the wires. The squared-off "shorting-bar" end was directly screwed down to the wood mast since this is "cold" as far as r.f. is concerned. This resulted in a fairly sturdy halo about 6" in diameter.

The quarter-wave linear matching transformer at the feed point is much simpler to construct than to describe. This "Q-bar" section, 20" long, is made from No. 8 aluminium ground wire spaced at 1". One spreader was installed in the middle. To facilitate the dropping-down of the twin lead feeder, this matching section is given a 90° twist so that the junction point of the section and the twin-lead is horizontal. This junction point terminates on a square bakelite block screwed to the braced strip of wood used to bring the feed point out at right angles to the antenna.

To forestall any possible electrolysis problems and to prevent any loosening of hardware which might be caused by wind vibration, we brushed coil dope on each screw, bolt, and nut, and on the spreaders on the matching stubs. This is real good insurance.



One of the four quarter-wave matching stubs. Note how it is curved around into a halo about 6 inches in diameter.

GUYING

Wire guys should come no closer than a quarter-wave (about 20") from the end of the bottom element. This leaves about 15 feet of the mast free to whip around slightly in the breeze. If you live in a windy part of the country you should add an additional set of nylon guys, fastened about at the centre matching transformer. Ordinary nylon fishing line is very good for this purpose.

PERFORMANCE

We installed our 2 metre "gain" antenna about 20 feet from our "reference" dipole and about the same height. The reference antenna was fed with about 85 feet of foam-type RG-8/U coaxial cable. The antenna was fed with about the same length of cheap 300-ohm t.v. twin-lead. A coaxial balun, used to transform the balanced line to the unbalanced coax input of the transmitter was installed right at the transmitter. A Knight-Kit P-2 bridge was installed between the balun and the transmitter. The s.w.r. on the reference antenna was 1.5 to 1. On the gain antenna it was 1.1 to 1. About a 2-to-1 increase in signal strength of stations received was noted. Stations worked immediately noted the increase in our signal. Mobiles especially could now be worked out to much greater distances.

All in all, the week-end we used to put together this antenna was well worthwhile. Since initial tests the wood mast has been lashed to the top of a tree, elements above the tree tops, at a height of about 90 feet. The feeder length is now about 125 feet. Mobiles (f.m.) operating on eastern Long Island have been reliably worked out to distances of 30 to 40 miles. And we run only 60 watts input.

TECHNICAL ARTICLES

Readers are requested to submit articles for publication in "A.R." in particular constructional articles, photographs of stations and gear, together with articles suitable for beginners, are required.

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A GUIDE TO IMPROVING V.H.F. PERFORMANCE

DAVID D. TANNER,* VK3AAU

THIS article is an effort to demonstrate a way of using limited resources to work over longer distances, and to show what effect various improvements will have on the range over which we can reliably work. Particular reference is made to two metres, but most of the points discussed are applicable to other v.h.f. bands as well. There are several factors which limit the distance over which we can normally communicate, these can be summarised as follows—

- (a) Transmitted power,
- (b) Receiver sensitivity,
- (c) Antenna gain,
- (d) Path characteristics.

Transmitted power is relatively simple. It depends on our input power, the efficiency of the final, and to a large extent on the loss in the feedline. This latter is one which has been the subject of a lot of discussion.¹ The choice of feedline depends to a large extent on what you are prepared to pay, but particularly where long runs are necessary, the best value for a limited amount of money seems to be formula III, open-wire t.v. feedline. Care must be taken in its installation to keep it free from sharp bends and to keep it away from metal objects. It should also be kept strained as tightly as possible. All these requirements limit its flexibility somewhat, but they are absolutely necessary to make the most of its low-loss characteristics.

Next we come to coaxial cables, many of which are not worth buying. The best of the disposals one seems to be UR/67 with RG-8A/U a close second if you can get it. The older type RG-8/U is not recommended as it deteriorates in the weather with an increase in losses. Thin types should be avoided, particularly in the construction of baluns. 300 ohm ribbon is not recommended as it is a poor performer when wet. Feedlines should be operated with as low a s.w.r. as possible, preferably below about two to one.

The next item on the list is receiver sensitivity, and this is where a lot of newcomers to v.h.f. have the greatest difficulty. A typical example of an insensitive receiver is the ubiquitous SCR522. It falls down in most departments when compared with the crystal locked converter-communications receiver combination used by most advanced stations.

First, the SCR522 has a poor noise figure because of its pentode front end. This can be improved by adding a pre-amplifier using one of the modern 6CW4 nuvistors² or a hot i.v. tube such as a 6ES8. Its second fault is its wide bandwidth due to the use of a 12 Mc. i.f. channel. The usual method used to make these receivers cover the two metre band is to disable the crystal injection chain and make the last multiplier stage into a tunable oscillator at approximately 132 Mc. As this

oscillator is generally not very stable, a comparably broad i.f. is needed to hold the signals within it. A better approach is to leave the crystal chain operating and to use a second conversion stage to 455 kc., using a tunable oscillator on about 11.5 Mc. The 12 Mc. i.f. can then be stagger tuned and possibly resistive loading added to make it about one megacycle wide so that for full coverage of the band the four crystal positions would be used. In this way as much selectivity as you like can be built into the i.f. and the receiver can be used to copy c.w. and s.s.b., the advantages of which will now be discussed.

A.m. phone requires a signal to be about 7 db. above the noise in a bandwidth of 6 kc. S.s.b. only needs to be about 3 db. above the noise to be readable and the bandwidth can be reduced to as low as 2 kc. This is a gain of nearly 9 db. over a.m. C.w. can be read with a 0 db. signal to noise ratio and the effective bandwidth of the ear with a 1 kc. beat note is of the order of 500 cycles. This is well worth considering when path losses are taken into account.

Another important part of the installation is the antenna system.³ This, in common with the feedline, is part of both the transmitting and receiving circuits, and is also quite important. For effective v.h.f. performance, antenna height is important, and as a rough rule, doubling the height of an antenna will increase signals by 3 to 4 db. A 12 foot yagi is about the equivalent of a 12 element phased array, although the latter will work over a wider band. A well designed yagi of one particular length is 3 db. better than one of half that length. Yagis should be stacked at least two-thirds of their length apart, preferably more for short ones.

Lastly, we come to the problem of path characteristics.⁴ This is something over which we have no control, although an appreciation of the factors involved enables us to predict the results which will be obtained when we make any improvements to our equipment.

Assuming smooth earth, we find that a path loss of about 156 db. exists at a distance of 25 miles between two antennae at a height of 30 feet. This increases to a value of 175 db. at 50 miles, 185 db. at 100 miles, 201 db. at 200 miles, and 214 db. at 300 miles. Using these figures, let us consider the performance of two stations using virtually unmodified SCR522 equipment with 12-foot yagi, 30 feet high.

Transmitter output power, 8 watts.
Receiver noise figure, 10 db.
Receiver bandwidth, 50 kc.
Feedline 50 ft. RG-8A/U 1 db. loss.

This results in a 7 db. signal above the noise at a distance of 45 miles. Addition of a 6CW4 preamplifier and converting to a bandwidth of 6 kc. will increase the range to 75 miles, and the use of c.w. with this set-up is effective up to 250 miles.

Now compare these figures with two stations using 3 db. N/F converters into narrow band communications receivers, with 150-watt transmitters and 18 db. antennae, 50 feet high. Using a.m. they can work one another at a distance of 310 miles, and this can be increased to 370 miles with s.s.b. and 420 miles with c.w.

Naturally, these figures will be modified in practical circumstances by the presence of hills⁵ and temperature inversion effects, but in general they will be found to be quite reliable. The nightly contacts between VK5ZDR and VK3NN are a good example of this.

REFERENCES

The following references to "QST" will be helpful in amplifying most of the points made above—

1. Ferber, "Coaxial Cable Attenuation," "QST," April 1959.
2. Tilton, "V.h.f. Antenna Facts and Fallacies," "QST," Jan., Feb. and Mar. 1964.
3. Bohmer, "Grounded Grid Nuvistor Preamplifiers," "QST," May 1963.
4. Bray, "A Method for Determining V.h.f. Station Capabilities," "QST," Nov. 1961.
5. Craig, "Obstacle Gain Techniques for 50 Mc. and Higher," "QST," Mar. 1958.

Most of these are obtainable through the W.I.A. libraries and the Editor may possibly be coerced into reprinting some of them if sufficient interest is shown.

W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. New members and those whose totals have been amended will also be shown.

PHONE

Call No.	Cer. Cnt-ries	Call No.	Cer. Cnt-ries
VK3MS	34 308	VK3JZ	61 218
VK3RU	3 303	VK3KW	4 211
VK3AB	45 301	VK3JL	14 211
VK3MK	43 283	VK3ATN	26 204
VK3AO	51 284	VK3AH	12 198
VK3FJ	21 280	VK3RV	23 188

C.W.

Call No.	Cer. Cnt-ries	Call No.	Cer. Cnt-ries
VK3KE	10 325	VK3RU	18 260
VK3CX	25 323	VK3AQ	78 246
VK3QL	8 301	VK3ARX	68 243
VK3FJ	28 288	VK3KB	75 239
VK3NC	19 285	VK3YI	39 231
VK3AGH	71 282	VK3EO	2 230

Amateur

VK3AX 68 146

OPEN

Call No.	Cer. Cnt-ries	Call No.	Cer. Cnt-ries
VK3RU	8 309	VK3NC	77 287
VK3FJ	32 305	VK3HG	3 274
VK3ACK	6 300	VK3JA	43 259
VK3AGH	83 296	VK3LL	23 248
VK3ME	74 295	VK3HR	7 233
VK3AO	76 292	VK3VN	18 233

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HIGH STABILITY VARIABLE FREQUENCY OSCILLATORS*

Part One—Considerations Affecting Performance and Survey of Types

PAUL HARRIS, G3GFN

THE performance of modern variable frequency transmitters is, in no small way, dependent on the inherent stability of the initial frequency control oscillator. Ideally a variable frequency master oscillator should possess the following principal features:

- (a) Have a short preliminary temperature/time stabilising period;
- (b) Maintain its calibration to a high order of accuracy over reasonable temperature excursions;
- (c) Retain its initial calibration closely after replacing valves;
- (d) Be acceptably insensitive to nominal variations in both h.t. and i.t. voltages;
- (e) Give high output;
- (f) Have low harmonic content; and
- (g) Key well.

While the foregoing features may appear obvious, nevertheless, detailed examination of them when related to design and practical considerations will be found worthwhile.

Insofar as the initial temperature/time stabilising period is concerned, even if the major frequency change does occur within a relatively short time from switching on, a v.f.o. which exhibits a continual and slow drift is unacceptable. In c.w. and a.s.b. operation, involving highly selective receivers or precise carrier reinsertion, such frequency shift is intolerable.

DEFINITION OF STABILITY

As all simple oscillators exhibit some drift, it is useful to define the amount which must not be exceeded when in the stable state. For Amateur purposes a v.f.o. may be considered to have stabilised when the frequency change rate does not exceed 15 parts in 10^6 per hour, i.e. 15 c.p.s. per Mc. per hour.

The layout and quality of components have a considerable bearing on the initial and long-term frequency shift of a variable frequency oscillator, and indeed it is enlightening to quantitatively assess the performance of two theoretically identical oscillators compounded from different quality components and constructed in alternative ways. However, at this stage we are not so concerned with drift attributable to components and layout, but rather, the inherent stability of a particular configuration. There are considerable differences between oscillator circuits in respect of the amount of the initial shift, stabilising period and long-term drift.

EFFECT OF CROSS-MODULATION

A particular effect, believed to be due to cross-modulation between the basic oscillator frequency and its harmonics, and the harmonics themselves,

produces currents at the fundamental frequency which can be out of phase, and varying in phase angle with the original fundamental frequency currents. These currents tend to shift the frequency of oscillation, depending on their amplitude and phase, and it can be shown that, as excitation is reduced, the magnitude of these currents also decreases and, consequently, the drift also reduces.¹ It follows therefore that the lighter the coupling needed to sustain oscillation, then the higher the stability of the oscillator, particularly initially when changes within the valve will have less reflected effect on the frequency-determining circuits.

CLASSES OF OPERATION

Experiments have indicated that the class of operation of an oscillator has a direct bearing on the initial and long-term stability, and these experiments verify, to a large extent, the cross-modulation theory. The impulses—feedback—applied to the tuned circuit can be such that the feedback current ranges between less than 180° and 360° of the cycle. Depending on the period, the oscillator may be classed as "A," "B" or "C" but in all cases grid current flows for part of the input cycle. Class A oscillators have the lowest harmonic content, shortest stabilising period and excellent long-term characteristics. Class C oscillators on the other hand can exhibit considerable variations in respect of long and short-term stability, and, moreover, have high harmonic content.

CHANGES IN TEMPERATURE

In any apparatus there can be no guarantee that the internal temperature will remain constant over a given period of from day to day. Changes in ambient temperature coupled with variations in dissipated heat are bound to produce differences in internal temperature. It is essential therefore that the v.f.o. is able to accommodate variations above and below the mean level without undue frequency shift and resultant calibration error.

Aside from considerations of rapid stabilisation and long-term stability, it is important to evaluate the effect of changing the oscillator valve on calibration accuracy. Even if a compensating control is fitted it is tiresome to have to adjust this to restore calibration after replacing the oscillator valve. In general, circuits having tight coupling between valve and frequency determining components show the greatest shift. Perhaps a good example of this is the Pierce 100 kc. crystal controlled sub-standard. Changing the valve inevitably requires adjustment of the com-

pensating control to secure zero beat against a Standard Frequency Transmission such as M.S.F.

VOLTAGE VARIATIONS

With the rapid short-term changes which can take place in mains voltages, not only is the h.t. likely to follow, but the heater supply as well. Highly accurate stabilisation is both expensive and complicated, but nominal stabilisation of the h.t. can be accomplished by relatively simple means through the use of a VR105/30 or VR150/30 or similar gas filled regulator valve. It is important therefore to evaluate the performance of a v.f.o. against variations in h.t. and heater voltage.

UNDESIRABLE OUTPUTS

At the present time, the transmitting Amateur is confronted with a formidable list of frequencies which must be avoided. By this is meant frequencies which are incidentally produced—harmonics—or inadvertently chosen—in multipliers—and which are likely to cause interference to other services. It is only too well known that television receivers are particularly prone to interference from Amateur transmitters, and, with the greatly increased sensitivities of modern receivers, the very wide bandwidth of front-end tuners, poor image rejection and high susceptibility to cross-modulation and blocking, harmonics and intermediate multiplier frequencies must have the closest attention. Much can be done by filtering and screening, but if the offending frequencies can be avoided, or at the very least substantially reduced, then so much the better. Many v.f.o. circuits are not only vigorous oscillators, but also, for reasons already discussed, produce a string of potent harmonics. Such oscillators should be avoided.

The price of using a v.f.o. with a low harmonic content is that the frequency multipliers must operate efficiently in their chosen mode having the stipulated drive, element voltages and tank circuit Q. Many so called multipliers rely to a fair extent on the harmonic content of the drive to produce the required output and are not inherently efficient multiplier circuits as such. While the factors affecting multipliers are not pertinent to this paper, suffice it to say that certain valves are more suitable than others for this type of service, but many other types can, under suitable conditions, provide satisfactory performance. Whenever possible reference should be made to the valve manufacturers' application report on the type being considered.

KEYING

While it is accepted as bad practice to key any v.f.o. directly, under certain conditions—such as BK keying for

¹ "Theory and Design of Valve Oscillators," H. A. Thomas, Chapman and Hall, London.

example—it is desirable to d.c. switch the oscillator in some manner, unless frequency shift keying is incorporated. If there is a frequency change during the initial current flow within the oscillator circuit, then this will give rise to chirp. An oscillator which meets all other requirements may well show chirp when d.c. switched. Care must be taken when assessing chirp as r.f. circulating currents due to badly disposed earth points, or reactive decoupling capacitors can produce this effect. Nevertheless different oscillator configurations have their own individual chirp characteristics.

OUTPUT CAPACITY

Finally, a variable frequency oscillator should have a high output capability, always provided that this is not at the expense of other more desirable features, especially in respect of harmonic content. The object of having a high output from the v.f.o. is not simply to use all this output and trim down on the following stages, but rather to be able to load the v.f.o. lightly and so work it well within its power capabilities. Heavily loaded v.f.o.s. always show frequency shift as the subsequent stages of the transmitter are tuned up, or as the transmitter is loaded. The frequency differences which occur between stations, allegedly on the same channel, are usually due to pulling of the v.f.o. frequency due to loading effects, rather than inaccurate 'netting'.

Under these circumstances the final result is a compromise between perfection and minimum obtainable drift. Hallcrafters have solved this problem very neatly in their HT33 s.s.b. transmitter. In this circuit, which is shown in Fig. 1, a differential capacitor is used in such a manner that varying the differential varies the amount of correction 'seen' by the tuned circuit. With this arrangement practically perfect temperature compensation can be achieved.

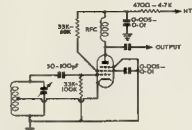


Fig. 2.—Basic electron-coupled Hartley

For most Amateur purposes, high quality components, attention to mechanical stability and component layout can, with a suitable circuit, produce an oscillator which is satisfactory even under critical operating conditions.

With regard to the frequency determining circuit in particular, the coil should be wound under as much tension as the gauge of the wire will allow, taking care when working with fine gauges not to stretch the wire. High grade non-porous formers are essential, and when winding has been completed and adjusted, it should be heavily doped. The use of a former having an iron dust core has much to commend it, as not only are inductance variations simply made by adjustment of the core, but also the physical size of the coil can be reduced. Caution is required in circuits where ferrite core coils are employed for, with high power, saturation may take place. However, this is unlikely in most circuits used in the low level stages of Amateur transmitters and certainly will not occur in any of the v.f.o. circuits to be described in detail.

Tuning capacitors should for preference be double spaced so that the effects of expansion, and consequent variation in capacity are held to a minimum. General mechanical rigidity is important, as is the method of securing connection to the rotor plates. The

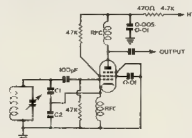


Fig. 3.—Basic electron-coupled Colpitts oscillator

quality of the insulation supporting the fixed vanes must be absolutely above reproach as otherwise the tuned circuit may well contain an unstable element.

The resistor which acts as the grid leak is normally effectively in parallel with the tuned circuit, or at least one element of the tuned circuit. For this reason it requires as much care in its selection as do the frequency determining components themselves. Not only must it be highly stable in its d.c. resistance, but also in respect of any self capacity or inductance. It should be well overrated in terms of wattage so that any changes which do take place are as result of environment—which can be controlled—rather than the actual current flow through it.

The valveholder requires special attention. Only first grade insulate mouldings with silver plated contacts should be used.

In considering the foregoing comments, it should be borne in mind that we are concerned with highly stable oscillators. Much licence can be, and often is, taken where the application is not critical, the frequency low, or automatic frequency correction circuits employed.

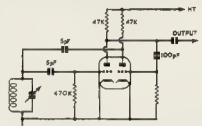


Fig. 4.—Basic Franklin oscillator.

Comments which apply to transmitter master oscillators are equally applicable to receiver local oscillators, and for that matter to secondary injection oscillators such as b.f.o.s. and carrier reinsertion oscillators. Despite the general advance in receiver design, only in the Racal RA17, Drake 2B and Collins 75A does any serious attempt seem to have been made to match local oscillator performance to other improvements. All too often 'domestic' type receiver oscillators are still to be found. In fairness to other manufacturers, there does now seem to be an awareness that these departments have been too long without attention. The increasing use of s.s.b. has undoubtedly shown the very real need for this revision in view of its particularly high demand on stability.

SURVEY OF TYPES

In the immediate post-war period, v.f.o. circuits were usually of the Hartley (Fig. 2), Colpitts (Fig. 3) or Franklin (Fig. 4) types. With care and attention both the Hartley and Colpitts could be made sufficiently stable for the receivers in use at that time, but invariably they required considerable individual treatment. Some were excellent, some were passable, but others could claim no polite label. All tended to be fussy as they ran in modes varying between class B and class C with tight coupling between valve and tuned

CHOICE OF COMPONENTS

Having dealt at some length with the main features expected of a v.f.o. circuit, and, inter alia, the reasons for them, it now seems prudent to examine the requirements in respect of components.

No matter how excellent the probable performance of any v.f.o. circuit, stability and drift are still at the mercy of the components employed, and so much in terms of their initial values—which can always be adjusted—but rather in respect of the actual stability of the components themselves and their ability to retain their original values through temperature excursions. Often negative coefficient capacitors are employed to compensate for changes which occur in values of frequency determining components due to heat. While it is acknowledged that, correctly applied, this can be highly satisfactory, it should be kept in mind that, so theory, perfect compensation can only be achieved at one specific frequency, and the greater the amount of compensation applied, the more frequency selective it will become. The usual problem encountered is that the exact value of negative coefficient capacitor is not available, or the one that is has an incorrect temperature/capacity gradient.

In the late 1940s the Clapp oscillator (Fig. 5) came to the attention of the Radio Amateur and received great acclaim.

in the same way as was the original Clapp design. This development was reported in the "Bulletin" in some detail.¹ What Vackar did to the Clapp very nearly equals what Gouriet did to the Colpitts. The result is an oscillator that fulfils almost perfectly the requirements stipulated in the second paragraph of this paper.

The Vackar—sometimes called the Tesla-oscillator (Fig. 8) operates over a wide frequency range, 2.5:1, before there is any serious reduction in output, and over the range of 2:1 the output remains sensibly constant. Given due care and attention, the Vackar can be used on a fundamental frequency of 72 Mc. where it shows an order of stability which is quite outstanding.

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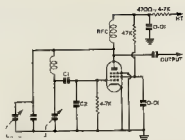
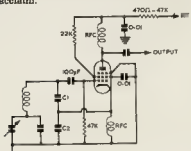


Fig. 8—Basic Vackar/Tesla oscillator

Although its output is high, harmonic content is low as it operates substantially in class A.

(To be continued)



The Clapp oscillator—originally developed by G. G. Gouriet, of the B.B.C. represented a major advance in variable frequency oscillator design as it substantially divorced valve capacities, and changes therein, from the frequency determining circuit, and in so doing, removed the major cause of

There is a family resemblance between the Clapp and Colpitts oscillators as examination of Figs. 3 and 4 will show. In the Clapp oscillator the frequency control circuit is arranged for series tuning, and as a result C1 and C2 form part of this circuit as well as being capacity divider for feedback purposes. In the Colpitts configuration, C1 and C2 are in no way associated with the tuned circuit but are a capacity divider pure and simple, other than from the point of view that the effective capacity of C1 and C2 in series is in parallel with the tuned circuit. In the Clapp oscillator, high values at C1 and C2 effectively clamp the capacity divider, and r_{eff} changes to their own very small values, $r_{\text{eff}} \approx r_{C1}$

there are very small with respect to these capacitors.

By achieving a high order of stability the Clapp oscillator has two disadvantages. First, the output drops rapidly if worked over a frequency range in excess of about 1.2:1. Second, while the Clapp can be designed to work at frequencies in excess of 10 Mc, as the frequency increases, the values of C1 and C2 decrease rather rapidly with the result that they no longer effectively swamp valve capacities, and so the principal advantage of this configuration becomes lost.

The Clapp oscillator was the subject of further development by Varian of the form shown in Fig. 10. The results there are very similar to those of the

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THE "PHASER" FOR TWO METRES*

JOHN A. FREDRICKS, K7GGJ

Many v.h.f. Hams have at one time or another wanted to try their hand at v.h.f. p.m. operation. If you are one of these fellows, then take a look at this. First I would like to point out that this particular rig is not complete in itself as a transmitter, but is rather an adaptor that can be added to any 2 metre rig to permit p.m. operation without impairing other modes of operation.

Now let us get on to the diagram, as can be seen in Fig. 1. The crystal oscillator is nothing out of the ordinary. It is, in fact, a modified Pierce-type of oscillator. The triode half of the 6J8 is used as the phase modulator and deviation is set by the capacitor CN. Maximum deviation will be attained at maximum capacity. No attempt to multiply in frequency should be made in either the crystal oscillator or in the phase modulator, as frequency "swing" at the resultant output frequency will be down. Frequency multiplication should take place only after the phase modulator stage.

I don't believe that much has to be said about the audio section except that deviation is also controlled by the audio gain control and you may not have to build the stage at all. You may be able to steal the audio from the speech pre-amp stage in the a.m. section of your rig. The reason that I built up the audio stage was so that I could go from p.m. to another mode of operation merely by turning down the gain control in the phase modulator unit.

In my 2 metre unit I simply removed the old crystal oscillator and built the p.m. unit in to the rig and now I utilise the p.m. osc. for all modes of operation. I would also like to point out that I did not include coil specs. because there will be some who will want to put this adaptor on 3 Mc., 6 Mc. and 8 Mc. to multiply to 2 metres and I also feel that anyone who constructs v.h.f. gear has the technical ability to come up with the appropriate coils.

The resistor divider network in the control grid of the triode half of the

● The author presents an easy-to-construct phase modulator that can be connected to any a.m. transmitter to achieve the same basic advantages found in frequency modulation. When the operator wishes to return to a.m., he simply turns down the gain control on the phase modulator!

6U8 is called an audio correction network and performs the following function: When a phase modulator is employed, the equivalent carrier frequency "swing" is in proportion to the amplitude of the audio signal. Rises in the audio signal frequency cause further undesired phase shift in the carrier. The unwanted rise in phase shift is removed by the use of an RC network to lower the amplitude of the audio signal in proportion to the frequency increase.

In this particular circuit a deviation of ± 7 kc. was attainable with the trimmer KN at full capacity, and the audio gain control "wide-open". I have had this adaptor on for about three months with very good reports so get out the soldering iron and good luck on 2 metre p.m.!

TV FREQUENCY CHANGES

The majority of television set owners would not be affected by the alteration in the frequency of the new national television channel to be opened in Townsville in September, the Postmaster-General, Mr. A. S. Hulme, said.

He said that a change in the frequency had been necessary in order that the Townsville station would not interfere with the Rockhampton station in the fringe area around Bowen.

The new frequency will be 87 megacycles for vision and 92.77 megacycles for sound.

He said that this should be within the range of fine tuning of the majority of television sets.

—Townsville Daily Bulletin, 8/7/84

*Publications Committee
Reports . . .*

Since the 13/7/64 to the 12/8/64 all inwards correspondence has been published in this issue of "A.R." except one technical article on a "Low Efficiency 80 Mx Transmitter" and a letter from VK4ZAZ.

In view of the poor quality wrapper previously being used on "A.R." it was decided to use a new style pre-printed type, even though the cost was greater. Readers are again reminded that if the mailing address shown on their "A.R." wrapper is incorrect they should notify their Divisional Secretary direct. Direct subscribers to "A.R." should write to P.O. Box 36, East Melbourne, C.2. All correspondence with the F.M.G. having been completed will be ordered to proceed with the printing of the new Call Book, which should be available about October 1964.

The Committee accepted with great regret the resignation of Ron Higginbotham. VK3RN has given long and devoted service to the magazine and it was decided that henceforth the Editor's Award for the best technical article will be known as the "Higginbotham Award". This is the most fitting manner in which Ron's service to "Amateur Radio" will be perpetually honoured. Mr K. Pincock has accepted the position of Assistant Editor.

CALLING ALL XYLs AND YLs

Some XYL operators have formed a small net on 80 metres. They are hoping that other XYL or YL operators will join in. At present the net is on about 3800 kc. on Thursday evenings at 2030K.

Interested XYLs can either break in on the net or contact Freda VK2SU or Brenda VK3KT who have skeds on 40 metres each Tuesday about 1400K.

Any non-licensed XYLs who can persuade the OM to operate the rig will be most welcome to the net.

AMATEUR FREQUENCIES:

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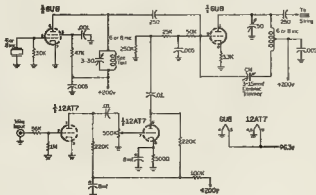
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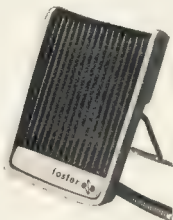
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Fig. 1—Schematic of the phase modulator as constructed by the author for 2 m μ operation. Coil specifications are not included, as you may want to use this unit for other bands (see text). All resistors are $\frac{1}{4}$ watt.





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Frequency response	200 to 10,000 c.p.s.

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SIZE: 3" x 2-1/8" x 1".
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7th JAMBOREE-ON-THE-AIR

17th and 18th October, 1964, starting 10 a.m. Saturday

WORLDWIDE interest in this annual event is increasing every year as more and more Amateurs and Scouts become aware of the potential that both organisations can contribute to international understanding and goodwill.

Last year over 300 Amateur Radio Stations were placed at the disposal of Scout Groups throughout Australia.

The Boy Scouts Association is very conscious of the help and co-operation that is being given to the Scouts and their Leaders, and much goodwill and publicity is received by the Wireless Institute of Australia, both overseas and in Australia through the many magazines and other publications of the Boy Scouts Association.

Since we know there will be many for whom this 7th Jamboree-on-the-Air will be their first, we will repeat the rules hereunder.

OBJECTS

Firstly, the objects of the Jamboree-on-the-Air are as follows:—

To let Scouts talk or listen to their brother Scouts, whether they be in the next town or in another country, and to learn about their activities, families and homes.

To introduce them to Amateur Radio and Electronics.

RULES

The Rules are as follows:—

1. License regulations must be strictly observed at all times.
2. Any part of the 48-hour period may be used.
3. Any authorised frequency may be used.
4. To take part, call CQ Jamboree or answer another station using this call.

5 You can use c.w., a.m., s.s.b., or any mode authorised.

6. This is not a contest. There are no prizes given for the most contacts made. A participation certificate will be sent to all Amateurs sending in a log sheet which will be provided by the Scout Group, or by sending a report to the Branch Organiser.

You will probably be approached by a member of the Boy Scouts Association, but if you are not and would like to help a local Scout Group, then write to your State organiser. The Victorian Branch Organiser is Mr. J. G. Nicholson (VK3AAN), 28 William Street, Glenroy, Vic.

ORIGIN OF JAMBOREE-ON-THE-AIR

During the Jubilee Jamboree at Sutton Coldfield in England in 1957, which was organised to commemorate the origin of Scouting some 50 years earlier, a number of Scout Radio Amateurs got together at the Radio Station there and held what they called a Hamfest. A suggestion was then made and enthusiastically adopted that Scouts should try to contact each other on a fixed date each year by means of Amateur Radio. Thus was born "Jamboree-on-the-Air".

The idea had a lot of merit, for although World Jamborees are held only every four years, the expense unfortunately precludes many Scouts from taking part, despite the fact that it is an experience that cannot be compared with any other Scouting activity—the experience of camping in a foreign country and meeting and making new friends from among the thousands of Scouts there from all parts of the world.

Those who attended the Sutton Coldfield meeting realised this, and recognised that the answer lay, to some extent, that it was still possible for Scouts to meet and talk to each other without leaving their own towns. So that as a means of bringing home to the average Scout the true meaning of World Brotherhood, without any expense to the boy or his parents, the scheme could not be bettered.

So in 1958, over the week-end of 10th and 11th May, the first Jamboree-on-the-Air was held, with Leslie R. Mitchell of England, an ex-A.S.M. of the Boy Scouts of America, and himself an enthusiastic Radio Amateur under the call sign of G3BHK, as the Honorary Organiser. Wide publicity of this initial attempt was given by the World Bureau.

It is interesting to record that despite the short notice given the event and the fact that weather conditions did not prove encouraging, quite a number of contacts were made, and the comments of those who did participate was so favourable (both from Scout and Amateur Station operator's point of view) that the Organisers were encouraged to start planning for the following year.

As Jamboree-on-the-Air grew to its present proportions, so did the need for greater organisation, and in response to requests from the participants of those early years, the Boy Scouts World Bureau took over the organisation, until now it has become an outstanding event in the World Calendar.

—Jack Nicholson (VK3AAN)
Victorian Branch Organiser.



MEET IAGI

GINO ANTONUCCI

via Dagnino 15/14, Genoa Pegli, Italy.

Gino, aged 44 years, has been in Radio as an Amateur for only three years, but in those three years has acquired an Amateur Station that does credit to the owner-operator. Gino in every day life is a chemist. I don't think it would matter how you called Gino, he could return on the mode you used. Gino has worked 182 countries and has 148 confirmed.



On s.s.b. he has a KW Viceroy plus a linear (1 x 812 e.g.). Receiver is a KW77. On a.m. the transmitter is a home-made 140 watt, which uses two 814s. For mobile and emergency work, Gino uses an NCX3 on 20, 40 and 80 metres with d.c. and a.c. power supply. For r.t.y. Gino's Hell. The antenna is a rotary beam, which comprises three elements on 20, three elements on 15, and two elements on 10 metres. He also has a ground plane for 20, 15 and 10 metres, plus a long wire on 40 and 80 metres.

Good for you Gino and more power to you. Thanks for the beautiful letter, also the photos. May we all, through Amateur Radio, get to understand each other much better than we could without it. 73 from VK.

—Bert, VK5BH

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ROSS HULL MEMORIAL V.H.F. CONTEST 1963-64 RESULTS

THE Federal Contest Committee takes pleasure in presenting herewith the results of the 1963-64 Ross Hull Memorial V.H.f. Contest.

From the comments received we feel that the deletion of the present scoring system for 6 and 2 metres under a distance of 50 miles between stations would be justified. Consequently we will recommend to Federal Executive that the scoring table be changed in this regard.

Some contestants suggested that the distance be 75 or 100 miles, whilst several thought that a return to the State contacting State system would be preferable. To quote one of the contestants: "Working all local stations puts stations in remote areas at a disadvantage to those located in areas of high local v.h.f. population."

The above change to the scoring table would eliminate the daily scramble for numbers in metropolitan areas and at the same time give the country contestant a fair chance in the Contest.

Another suggestion worthy of consideration is that the duration of the Contest remain as at present, but that the period for which a contestant may submit a log be reduced from one month to nine days or sixteen days. This may increase the number of logs submitted and increase activity. At present it seems that a number of Hams compete in the Contest for a couple of weeks and then become disinterested for one reason or another and do not bother to send in a log because their chances of winning the Contest are small. One line of thought is that a contestant would be prepared to concentrate his activity in say a 9-day period but still operate over a period of one month. He would forward a log for the nine

consecutive days in which he scored the most points. This suggestion has some merit. What do you think?

This year's honours go to VK3ZDR, M. J. McMahon, with a score of 7,746 points, and was a very fine effort. In conclusion we would like to congratulate the other award winners and thank those who competed and submitted logs.

—Federal Contest Committee, W.I.A.

TROPHY WINNER

VK3ZDR—M. J. McMahon 7746 pts.

AWARD WINNERS

Section A—Transmitting, Open

VK2ASZ—R. L. Lear	2051 pts.
VK3QV—D. H. Rankin	1048 "
VK4PU—J. D. Purdon	597 "
VK5TN—B. G. Tideman	1368 "
VK6HK—D. E. Graham	1262 "
VK7DK—D. H. Kelly	874 "
ZL3RZ—G. Burrell	1310 "

Section B—Transmitting, Phone

VK1VP—E. Penikis	2147 pts.
VK2ZCF—R. C. Norman	2791 "
VK3ZNJ—K. W. Jewell	2503 "
VK4ZEK—D. J. Gemmell	2594 "
VK5ZDR—M. J. McMahon	7746 "
VK6ZDT—T. M. Stanicic	2664 "
VK7ZAP—W. J. Henry	1858 "
VK8ZCX—J. B. Masters	1748 "
VK9ZBV—J. P. Hayden	514 "
ZL1AUM—C. Maddock	1530 "
ZL2AAH—B. D. Gibb	900 "
ZL3RK—T. J. McKenzie	1230 "

Section C—Receiving

WIA-L2242—D. J. Patterson	1333 pts.
WIA-L3138—G. N. Earl	2276 "
WIA-L5049—D. R. De Cean	195 "

INDIVIDUAL SCORES

Section A

VK2ASZ—St. Marys	2051 pts.
VK3QV—East Malvern	1048 "
3YS—Box Hill	227 "
VK4PU—Woombye	597 "
VK5TN—Kings Park	1368 "
VK6HK—Wembley Downs	1262 "
6MM—Nedlands	1052 "
VK7DK—Launceston	874 "
ZL3RZ—Westport	1310 "

Section B

VK1VP—Canberra	2147 pts.
VK2ZCF—Croydon	2791 "
2ZLP—Armidade	2158 "
2ZFB—St. Marys	1665 "
2ZFS—Gonnellabach	1098 "
2ZSK—Dover Heights	627 "
2ZJD—Woolongong	87 "
VK3ZNJ—Beaumaris	2503 "
3ZJG—Edithvale	1608 "
3ZIG—Mildura	1019 "
3ZOL—Morrington	771 "
3ABF—Altona	483 "
3ZGL—Keon Park	308 "
3NY—Yanac	286 "
3ZOP—Moorabbin	185 "
3ZMS—Frankston	191 "
3ZOS—Yanac	180 "
VK4ZEK—Hawthorne	5294 "
4ZAL—Deagon	1689 "
4RO—Ayr	827 "
4ZGA—Ayr	811 "
4ZWL—Calms	666 "
4ZBC—Calms	378 "
4ZWB—Calms	539 "
4ZJM—Gordonvale	247 "
4ZDG—Ayr	84 "
VK5ZDR—Henley Beach	7746 "
5ZBR—Gawler East	3633 "
5ZBK—Gawler East	1726 "
5ZDX—Oaklands Park	1600 "
5ZK—Plympton	1524 "
5ZGF—Plympton	1505 "
5ZSG—Seacombe Gardens	1492 "
5ZJH—Somerton Park	1292 "
5ZEL—Forreston	1107 "
5WV—Elizabeth North	920 "
5CL—Nermon	780 "
5ZBC—Mile End	379 "
VK6ZDT—Mt. Yokine	2684 "
6ZDS—South Perth	1422 "
6ZCD—Albany	1313 "
6ZDE—Nedlands	1265 "
6LK—Mt. Pleasant	1021 "
6ZAL—Bunbury	192 "
6ZAG—Mt. Hawthorn	126 "
VK7ZAP—Hobart	1858 "
VK8ZCX—Darwin	1749 "
VK9ZBV—Port Moresby	514 "
ZL1AUM—Auckland	1530 "
ZL2AAH—Foxton	900 "
ZL3RK—Christchurch	1250 "

Check Log: VK6SW.

Section C

WIA-L2242—D. J. Patterson, Miranda	1333 pts.
WIA-L2211—R. C. Abernathy, Miranda	1089 "
WIA-L3138—G. N. Earl, Black Rock	2276 "
WIA-L5049—D. R. De Cean, Brighton	195 "
VK5—Miss J. Martin, Wild Horse Plains	8 "

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John Moyle National Field Day Contest 1964 Results

THE number of logs submitted in this year's Contest was less than last year and the individual scores were not as high as previously. Very few comments were received regarding the extension of the operating period or the change of the title of the Contest.

It is to be hoped that more operators will be enticed into the field for next year's Contest to increase the activity.

The logs submitted, generally speaking, were quite good, but some of the S.W.'s. claimed points for hearing fixed stations and this reduced some of the claimed scores quite considerably.

As in last year's Contest, the Multi-Operator Stations were very active and in most cases used all bands from 1.8 to 576 Mc., using a combination of home-made and commercial equipment. VK3APC had no fewer than 28 operators and junior assistants.

Transistorised equipment was quite popular, particularly d.c. to d.c. converters and transistorised modulators. Several operators used transistorised converters and fed them into car radios, Command receivers, etc.

The troubles encountered by operators were many and varied, and the following are a few selected at random. VK2NA, the Narranderra Radio Club station, operated at a spot called Dry Lake and had the misfortune to be washed out by a thunderstorm on the Saturday night. VK5OR, E. H. Busenschutt, had transmitter trouble at the start of the Contest due to the unfor- giveable omission (his words) of two vital high tension by-pass condensers in the transmitter.

The aerials used ranged from beams to 300-foot verticals suspended by hydrogen balloons. The G5RV antenna was a popular one.

In conclusion, we would like to congratulate the award winners and thank those who submitted logs and hope that we will again see you next year.

—Federal Contest Committee, W.I.A.

AWARD WINNERS

Section A (Portable, Phone)

VK1SB—S. E. Brown	174 pts.
2RX—A. R. Hennessy	399 "
3AAW—W. G. Wines	181 "
42K—R. M. Feenaghty	666 "
5TH—T. Mitchell	382 "
6JO—R. J. Skevington	142 "
7DK—D. H. Kelly	505 "

Section B (Portable, C.w.)

VK1SB—S. E. Brown	171 pts.
2ASZ—R. L. Lear	195 "
3APJ—P. J. Dettman	350 "
5ZF—L. L. O'Donnell	311 "
7CH—C. Harrison	152 "

Section C (Portable, Multi-Op.)

VK2AWI—V.h.f. & T.v. Group of N.S.W.	597 pts.
3APC—Moorabbin & District Radio Club	2968 "
5LZ—Elizabeth Amateur Radio Club	3047 "

Section D (Fixed Stations)

VK1RD—R. Davis	590 pts.
2APK—D. F. Kiesewetter	645 "
3XR—J. Stafford	470 "
4LT—A. E. Carter	240 "
5RR—R. G. Harris	265 "
7SM—S. G. Moore	580 "

Section E (Receiving)

VK1—J. Watson	440 pts.
WIA-L2033—D. W. Shephard	280 "
WIA-L3042—E. W. Trebilcock	695 "
WIA-L2233/VK4—R. Erwin	165 "
WIA-L5065—A. Rafferty	190 "
WIA-L6021—P. W. Drew	55 "
VK7—R. W. Mutton	305 "

INDIVIDUAL SCORES

Section A (Portable, Phone)

VK1SB	174	VK6JO	142
2RX	399	6MM	88
2ASZ	189	VK7DK	505
2VL	67	7KH	108
2DU	40	7CH	74
VK3AAW	181	7AL	36
3JO	147	7ZAI	26
VK4ZEK	666	7ZAS	25
VK5TH	382	7GV	20

Section B (Portable, C.w.)

VK1SB	171	VK5OR	57
VK2ASZ	195	VK7CH	152
2VL	60	7DK	50
VK3APJ	350	7GV	27
VK5ZF	311		

Section C (Portable, Multi-Op.)

VK2AWI	597	VK3YS	223
2ANT	349	VK5LZ	3047
VK3APC	2968		

Section D (Fixed Stations)

VK1RD	580	VK4LT	240
VK2APK	645	4VX	115
2ALZ	190	VK5RR	265
200	170	5CL	190
2AAH	145	5WC	140
VK3XB	470	VK7SM	580
3AJK	275	7RY	50
3EF	270		

Check Logs: VK5LD, VK5CV.

Section E (Receiving)

VK1—J. Watson	440 pts.
VK1—I. Raine	355 "
VK1—A. Davis	185 "
WIA-L2033—D. W. Shephard	280 "
WIA-L2280—R. Bowden	50 "
WIA-L3042—E. W. Trebilcock	695 "
WIA-L3188—C. R. Christiansen	440 "
WIA-L3144—P. Gibson	430 "
WIA-L3138—G. N. Earl	405 "
WIA-L3158—R. L. Harrison	380 "
WIA-L2233/VK4—R. Erwin	165 "
WIA-L5065—A. Rafferty	190 "
VK5—K. B. Rendell	105 "
WIA-L6021—P. W. Drew	55 "
VK7—R. W. Mutton	305 "

★

THIS MONTH'S COVER

This is VK5ZC, Al Penny, situated at Risdon Park, Port Pirie. Al runs 150 watts a.m. from the MacMillan transmitter to a G4ZU. The receivers are an E.I.L. and an Eddystone 750. A keen and efficient c.w. operator, and for this Al uses the bug. He is the proud father of one son and two girls. After spending some time at the Channel 7 transmitters in Adelaide, he has returned to the old firm of H. G. Palmer, where he is service manager for their local branch at Port Pirie. Always eager for the chance to join in a contest, Al has many certificates to his credit. At the moment he's busy putting ointment on the itch that he's getting from s.a.b.

—Sert. VK5BB.

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V.H.F.

With the advent of spring and the approach of another v.h.f. DX season, the number of hours devoted to operating on 5 and 3 is bound to rise for most of us. This is going to mean a lot of fun, a chance to raise our antennas and in not a few instances, more t.v. Even if your station is capable of getting into a lot of t.v. sets, you may not encounter much neighbour trouble, so long as you operate only at widely spaced intervals and for short periods. But when the operating pace picks up, so does the neighbour response.

Some of the discussions overheard on the air show that the Amateur in question has not the foggiest notion of what causes the t.v. or what to do about it. Too often he just lets the situation deteriorate, does nothing to correct it, or help his neighbours. When this happens they are bound to explode eventually—and being able to prove his transmitter is "clean" will be no solution to the mess he is in by then.

It may be true that the transmitter is not at fault, but nothing is gained by jumping up and down and declaring this fact in angry terms. For some years now, t.v. (all kinds) has been for more a public relations problem than a technical one. We know that t.v. can be cured and that often the cure must be made at the receiver end. But your neighbour doesn't know it, and you will get nowhere in convincing him, unless you are willing to lean over backwards in the matter of neighbourly co-operation.

Rule 1: Never let t.v. drag on. If you know you have it, get to work. You have to convince the t.v. owner that you are at least interested as he is in clearing up the trouble.

Rule 3: Never lose your temper. Once you and your neighbour start shouting at each other you are done for. No matter how angry he gets you must keep cool. Bigger yet, keep friendly.

Rule 4: Learn the causes and cures for t.v. Be aware of the factors that are causing the trouble and that you know how to fix it. The initiative and knowhow must come from you—the owner or the serviceman who almost certainly be of no help.

If you cannot obtain the co-operation of the neighbour you should enlist the services of the A.I. who will assist you in this matter.

From the July issue of the *Australian V.H.F. Group News Bulletin*: "The committee of the Group announced that the winner of the Parkes Trophy for 1964 is Charles 61Z. This award was made for Charles' work on 423 Mc. tx and rx in particular, as well as his earlier work on 876 Mc. Charles is the co-holder of the present VK6 record for 423 Mc. and co-holder of the Australian 17W Mc. record. Sept. 12-13 is listed as a V.H.f. Field Day in VK6. 6KN reports Channel 0 was around on Sunday, July 1, at 1610 hours. W.A.S.T. is concerned being that in 1963 on July 15, 50 Mc. was open from VK6 to VK3, 3, 4, 5 about the same time." This issue contains the constitution of the W.A.

V.h.f. Group, which could be used by any Group wishing to cover these same objectives. Keep up the good work, VK6 V.H.f. Group.

Further news has arrived regarding the new 144 Mc. record between WEDNG, Long Beach, California, and OHNL in Finland, which resulted in the first West Coast U.S.A. to Finland two-way QSO above 90 Mc.

It took place on April 12, 1964, and represents the longest 144 Mc. QSO by Mousbroek. The gear at WEDNG comprised eight T-element Yagis stacked 4 x 2 with an "honest" gain of 15 db. per bay. This can be elevated in angle above the horizon as well as azimuth. Some 50 odd antennas were tried in the cause of their attempts and the one used found to be the best. The transmitter was 1000 watts c.w., the receiver a 4169 pre-amp to a Navistar converter and a T8A4 with noise blanketer plus an audio filter. OHNL used a 23 element colinear, 2 mW converter and a 100W receiver, and the transmitter 400 watts to a pair of OBI/300s. Signs were \$2-3 both ways.

The effort took place over a long period of time, although signals were heard on many occasions. No two-way signal was made until 12. WEDNG found that conditions were best when the moon was high and the air clear. This is in line with previous experience which suggested that the moon was a factor. The big question was polarization, both normal (vertical) and horizontal and circular were tried and choices from the moon were received by all types, however horizontal polarization was used for this effort. Our congratulations to all concerned and trust that the Amateur spirit, will continue with bigger and better DX for those who try next.

Your subscriber would be pleased to hear from any v.h.f. visitor to Melbourne. When in Melbourne contact me by phone (home) 25-2171, (business) 207-3341 (9-5). Any news items will be greatly appreciated. Your Group Bulletin Newsletter, and visitors of interest would be most welcome.—VK3ZGP.

NEW SOUTH WALES

V.H.f. T.M. Activity in VK6: Frequency in use is 144.00 Mc. and we have now started putting in our number 3 channel, which we have made to coincide with VK3, 14. 264 Mc. and a few more along the second channel. We anticipate putting the second channel off the air for the whole period of Oscar III's flight, since its beacon transmitter is only a few kilocycles away from us.

Main make of unit in operation is the T.C.A., which uses a 2/12 final, and after mode, the rx gives around 30 db. of quieting for 1 uV in, but to help things along, most of the net have installed extra coils from tri-amps, or Navistar pre-amps, giving as good as 0.1 uV. sensitivity in the better units. Polarization is a few kilocycles and base stations run up to the full 150 watts.

Numbers are rising quite fast now. From the first two (22XZ, 22BL) over 18 months ago, we now have about 30 and most of them are amateurs with their own stations in the next couple of weeks. I'm quite happy too, now that I have my all transfer rx (mine—23 transistors) 0.1 uV. to operate the net, and 700 milliwatts output from the rx, using nickel cad. batteries, which gives up to 10-13 miles whip to whip.

There is no net here, and no more about to start one. Normal 6 mW operation is very spasmodic. 73, 22BL.

Your Sub-Editor (3ZGP) has received a copy of the V.H.f. Newsletter No. 3, a monthly publication of the V.H.f. Group. Unfortunately it arrived too late to direct it for items of interest, but a quick run through of 13 pages was enough to convince me that the Group, through its Editorial Staff, has the makings of a really interesting Newsletter. Those interested should contact the V.H.f. Newsletter Managing Director, Les 2ZPF, Hawthorne (VK3HL), 523 Pacific Highway, Artarmon, N.S.W. The annual subscription is 5/-.—3ZGP.

VICTORIA

Over the past month all bands have been fairly inactive. A new net has started on 8 mW. the Western Suburbs Dept. C/O. Ross 2ZVW, writing they have not had any complaints of L.V. Cyril 2ZCK, Les 2ZPB and Vic 2ZPV

are putting the finishing touches to 8 mW tx's each will be running about 50 watts.

Tex 2W24: 3 mW Fox Hunts are held every third Wednesday and are usually attended by five or six bands—these are getting more popular.

8 mW Scramble: The last 3 mW Scramble, held in Melbourne, saw the total of 29 stations. The winner was 2ZCN who worked 19 stations in the 30 minutes allowed.

Lindsay 3YR and Geoff 2AUX can be heard on 1296 Mc. They are tripping from their 423 Mc. tx's.

A tape of a lecture by an R.I. from the Department on T.V. will soon be available for loan from the VK3 V.H.f. Group, 72, 2ZCK.

QUEENSLAND

Last month a number of new call signs appeared on the v.h.f. bands. Jim 4JA and Walter 2ZVW have both made intelligible noises on 144 Mc. Ross 4ZRD and Rex 4VX have made their debut on 53 Mc. Rex 4VX takes pride in informing me he is a genuine refugee from 30 mW activity. Walter 4ZPF is operating from St. Leo's College at the University of Queensland. Space is a problem for him, the masts he has to raise are 40 feet of concrete to have a contact. There is an obvious moral to this story. Put a ground plane up Walter and give the r.f. a fair go!

Ron 42K will be operating on 423 Mc. every Sunday afternoon and evening from November onwards. He will be using 100W. and will be looking for contacts.

Tom 42RH and Phil 42EP, although not new to the v.h.f. bands, have both made contacts on 3 mW. We also expect 40S, the Oakleigh Boy Scouts, to wire up their 2 mW tx's in the near future. John 42VB is having trouble with his transmitter, and visitors of interest to air miles from Brisbane, one evening he had a hectic time trying to sort out the call signs called him 2 mW.

At the moment Roy 42RM is having a holiday. However he also has a broken leg to keep him occupied and this is the reason for his call at home. Roy has been on the air for quite a while now and suddenly has t.v. trouble. However it seems that his tx was clean, but the 83 Mc. spurious was coming from his modulator.

What has become of the chaps up in Ipswich? Tom 42AL has had his bird perch in that direction but reports that he doesn't hear anything. There is quite a strong body of v.h.f. s.w.'s in Ipswich and to date more than seven parties are known to be listening around the 144 mW band.

The Jamboree-on-the-Air looks like being something on the v.h.f. bands this year. In particular, Vince 4VJ and Bob 42RC will be in the trop. Fred 4VJ and Mick 42EA will be at the Sandgate Scout Hall.

On 6 mW virtually all the activity is between 83 and 85 Mc. here in Brisbane. We have received 24 letters reports from 200 mW frequencies in use there, but we would be interested to learn more accurately of these from the future. There is a strong body in the DX section. This applies particularly to VK3, 72, 2ZPL.

SOUTH AUSTRALIA

Our usual correspondent, Al 2EK (formerly 2ZCR), having now been firmly attached to the ball and chain, is at present absent, enjoying the love and attention of a housewife. Rumours say he is probably headed towards VK3 land. We wish you well Al, and the v.h.f. notes will still be available for you to see. If you return, you will be right in the meantime, I shall do what I can to fill the gap.

2Z ME: Activity still seems to be at a very low level. Admittedly S.A. has had more than its share of gale-force winds, heavy rain, plus sunny frosts, enough reason to keep many from venturing out. The long range towards cross-band contacts to 144 Mc. difficult areas of strong signal from Channel 8 due to aerosol spotting on 3 when transmitting 6. This seems to be more pronounced where converters use an L.f. of 7 Mc.

No DX has been reported on the band since changing from 50 Mc. The report of the long-range contact between Les 2ZVW and Herb 2ZNN and Mick 2ZDR, a distance in excess of 300 miles, signals 5 x 3 each way, and

THE BEACON BOX

VK3VF—

6 Metres — 53,000 Mc.

2 Metres — 144.800 Mc.

One call on c.w. then carrier for 40 seconds. Then repeat, etc. Operation is almost continuous.

VK6VF—

6 Metres — 52,006 Mc.

2 Metres — 145,060 Mc.

Automatic c.w. identification with approximately four seconds key-down position. Operation: continuous.

VK3: ATVO

51.75 Mc. f.m.

0800 — 2300 hours daily.

(100W e.r.p., 3650 ft. elevation)

very steady on 17th July. Mick regularly works 1000 on 3 m at varying signal strength. Geoff SZCQ now has 130w to play with, having fixed the bugs in the new modulator which were building up the usage of this new rig. Mick SZCQ is still looking for a new mobile heard strongly on 63.1 Mc. John SZEP is being heard almost daily with his new mobile. The new mobile for the 63.1 Mc. Club, will be on 63.0 Mc. soon, looking for contacts mainly around lunch time.

Jack SZKW is a new station on the band and is looking for contacts. He has been on in 3 or 3 months. Ian SZIK is still looking for contacts from Yorktown on about 53.7 Mc. Bob SZK has the new rig on 63.1 Mc. has a mobile plus to the erection of a new tower 50 ft. plus tubing. The "Station with the big Sound" promises to be even bigger when the rig is complete. Especially if the rig is retained by Garry SZK, who did a similar retention job, are any guide.

144 Mc.: This band has certainly shown a measure of activity unknown for some time in the past. If this can occur with cold wet nights, it suggests well for the warmer months ahead. Stations newly on the band over the last couple of months include Bob SZYK, Kevin SZAC, John SZEP, Mac SZLM (new tx), Lloyd SZGL, John SZED, Joe SZFW, and Wal SZFW. Using 100w, to build up the band. It is reported Jim SZMJ shifted 100 tr load of gear and rubbish, etc., to his changed QTH at the Port Pirie area. Most Amateurs could be in the same boat. Ern SZEN, also at Pirie, is now using four 18 element yagis 303 ft. high. Using 10 w, he can land a 5 x 9 signal into Adelaide 180 miles away. The recent gear has added a bend to the final section of the mast, much to the alarm and annoyance of Ern. Talks of a new system, Jim SZMJ, is currently playing with an over ten yagis in an effort to land into Adelaide stronger. News from the boys in the South East is pretty much in the same state. The station activity is quite strong down there. Some notes this way would be appreciated here.

435 Mc.: Not much to report here. John SZKR and Herb SZNN are running crystal controlled contacts. Brian STN has completed his converter. Mick SZDR has a very satisfactory converter going, using a 707T in the front end and a 6X4 in the back. The rig is working well. Penela, a distance of 230 miles. Mick reports signals 8 x 8 on 2 m, and 5 x 7 on 433 Mc. For the 433 Mc. rig, he has worked out the signals on 433 were not subject to the QSS on 8 m. Eric SZEX will conduct tests shortly on 433, using a converter supplied by Brian STN. The rig is working well. The difficult Mt. Lofy Ranges into Adelaide. The distance is about 28 miles, but the path very rugged.

General. Jim SZB, formerly of Leigh Creek, is now living at Elizabeth, and has been heard on 2 m. Kevin SZED is now ZEP. The VK3 club is planning to have a concrete details of the operation, or otherwise of any bescon tx in other States. We are not sure whether the VK3 boys show on all the time, and we know nothing of the other States—what about some details chaps? 73, SZEF.

South East Radio Group. David SAW and Herb SZNN are still working chinks on 433 Mc. and are planning to have a concrete details of the operation, or otherwise of any bescon tx in other States. We are not sure whether the VK3 boys show on all the time, and we know nothing of the other States—what about some details chaps? 73, SZEF.

South East Radio Group. David SAW and Herb SZNN are still working chinks on 433 Mc. and are planning to have a concrete details of the operation, or otherwise of any bescon tx in other States. We are not sure whether the VK3 boys show on all the time, and we know nothing of the other States—what about some details chaps? 73, SZEF.

South East Radio Group. David SAW and Herb SZNN are still working chinks on 433 Mc. and are planning to have a concrete details of the operation, or otherwise of any bescon tx in other States. We are not sure whether the VK3 boys show on all the time, and we know nothing of the other States—what about some details chaps? 73, SZEF.

In Geraldton some crayfishermen have a hard time getting through to land on 6300 kc. Recently a lone fisherman copying her husband on the dual wave set, had to ring through to tune, because they couldn't hear him, and she was relaying messages for a couple of hours. A case for v.h.f.?

Heard Dennis GAW on 2 m last week-end, cross-hair to Viv SZCQ on 8. I first heard him faintly on 6 with the third harmonic from my 48 Mc. rock. It was some signal.

Techs in training with the P.M.G. get a 25% per annum proficiency allowance if they get 75 per cent. or more in all subjects. This is better than stripes, eh?

Roy SZKW is on a nice hill in Baywater and should work much DX this year if his new mast survives the gales.

About a dozen chaps have W.L.C.K.N. mobiles gear on 62.65 Mc. and can be useful at the next civil emergency.

Sunday, 26th July, the rain and wind storms were gusty, old chap, and there was only one station on the air all day—SZBW with a relay of the Wireless Institute news, and he closed down just as the news was getting interesting. One of his harmonics pulled the wLr plug?

61R, 63R, 62AG are using 42R's and several more are contemplating it. 100w, at 100 mA.

is a nice working temp. 6MM will be running a pair in AB1 this Christmas with 300w p.p.p. (300w, 100 mA, idling, 150 mA, max). He also has a 60 ft tower (home made too) and a 5 over 8 stacked yagi array. So if he doesn't work those 62's, who can? If he does it may convince the boys there is summat in s.h., but they'll take some convincing. 73, SZAG.

REPLY

V.h.f. activity has shown a marked increase during the last month now that the P.M.G. senior techs exams are over. 92QB and 92BV are active again, 9CK has been heard more often and we all welcome a newcomer to Bryan 92JD, who will soon be active on the bands. There is great activity in the construction, as 92CK, 92BH and 92JD are busy with bigger and better transmitters for 52 Mc. 9CK and 92BV are busy with converters for Oscar III.

52 Mc.: No signals outside local area heard during the last few months. 9CK and 92BV mobile, worked up to 45 miles during recent tests and might have done better but for the lack of further road.

144 Mc.: Small amount of local cross-band duplex work by 9CK and 92BV. 73, 92BY.

YOUTH RADIO CLUBS

Loads of news from VK3-34—new clubs springing up all over the place—many certificates earned. It makes very pleasant reading and a number of people can feel happy about it, but can we find another 100 club leaders? Perhaps a list of State Supervisors would help:

VK3-R. C. Black (VK3YA), 3 Bennett St., Kingsgrove.
VK3-K. Mitchell (VK3TL), C/o Burwood Teachers' College, Burwood.
VK4-F. Taylor (VK4JC), C/o. Clontarf Beach High School.
VK3-Rev. R. C. Outberlet (VK3OD), P.O. Box 88, Mt. Barker.
VK3-James (VK3VA), C/o. Wesley College, South Perth.
VK3-E. Beard (VK3TB), 148 Derwent Ave., Lindendale.

How is this for help from a 'Division Council'? Thanks to the interest of the VK4 Council, clubs at Downslands College, Gympie, Clontarf and neighbouring De La Salle have each an ARRL newsletter. There is a regular Y.R.C. page in the Monthly Bulletin. Other news from VK4 shows a lot of activity in a short time. Club station at De La Salle continues (VK4DE). New clubs on the way at Cairns High 18 members including five YLs, with leader another teacher, Alex (4MA) North Rockhampton High (20 members, with Silas 4SC, another teacher), Padua College at Kedron (with Rupert 4ED) and a new club at Ipswich Grammar. Gravatt High, Goodwindmill High, Wavell High (looking for a receiver), and Downslands College (the Y.R.C. boys building a 22A for P. Yeids). Eight Elementary Certificates issued to Downslands, 3 to Gympie, 1 to De La Salle.

VK3 Newsletter No. 13 is hand. First Junior Certificates in VK3 to seven members of Koorumburra High. The total of Elementary Certificates now up to 37 with three to Grey St. High, St. Pauls, and one to Caulfield. Val Barnes, Y.R.C. Equipment Officer, has been receiving some equipment for distribution but can take no more. The Y.R.C. staff at Collingwood Tech. and assists the club. Activity reported at Caulfield High but no club leader yet.

VK3 clubs keep rolling along in their multitude. Well, at least we have our nose in front for the present, but will welcome all challenges. New clubs reported at Fort St. John's High, St. Mary's High, St. John's, Kingsgrove North High, and North Strathfield Boy Scouts. The last group benefited from a workshop under the supervision of a Minister, of Fyrmble. Another fine donor was Graham Hall (4AGH) who donated a large quantity of capacitors and some new transistors. The quantities were such that many clubs will get a parcel—many thanks to Graham. Also generous was Mr. J. Hancock, in charge of the Y.R.M. Revolutions over the last year, who donated an obsolete computer section containing many useful components including twin-triodes, 7- and 8-pin sockets, etc. He has also offered to show small groups

over the Y.B.M. Computer factory. Interested club leaders should telephone him. Incidentally, Mr. Watkinson, of Amalgamated Wireless Valve Co., will gladly show groups through the factory you have two very interesting visits there, all you clubs in Sydney or visiting the metropolis. Five good Elementary Certificates to Rex Black's group at Kingsgrove. Better still, the first Intermediate Certificate was gained by Gregory Dunne, of Kingsgrove, who was a member of the group.

The Institute of Radio and Electronics Engineers' pennant for 1963 success was presented to George 1GB and Roger 1KD, representing Lynsman High, on Canberra ceremonial recently, with suitable press publicity. It all helps the cause.

Only a little news from VK5 but it's good. Port Pirie Y.R.C. gained five Elementary Certificates. The Y.R.C. is getting some Divisional help, for which thanks! How about some news, Bob—if we're friends 73, 1KM.

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FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

FEDERAL

I.T.U. FUND

As agreed at the last two Federal Conventions, Divisions were given target figures to meet towards granting representation at forthcoming I.T.U. Conferences. To date, the percentage of the target figures met are shown by States —

VK3	—
VK2	35%
VK4	34.8%
VK5	—
VK6	31%
VK7	—

The above figures represent monies received by Federal Executive and not necessarily monies still held by Divisions.

FEDERAL QSL BUREAU

Bob KEMMIG requests the assistance of any VK Amaturs equipped to take part in the Moonbounce project. Stations would need the equipment for 1930 mHz, with at least 100 watts and a good antenna. He points out that startling results have already been achieved on lower frequencies and cites 144 Mc. contacts between W6DNG and G6HNE last April by Moonbounce.

The Korean Amateur Radio League reports progress and now has 400 members, 100 licences and 60 Amateurs. They plan an exhibition in April 1965 and desire photographs of typical Ham Stations. Photos should be 13 x 20 cms Secretary is H961AJ, Box 185, Seoul, Korea.

E. R. (Bob) Hatterley, VK8RB, ex-GSPJN, is currently active on Norfolk Island on 14 Mc. Bob expects to be on the island until at least January 1966. QSLs to Box 36, Norfolk Island. VK8RB also been heard on a.s.b. from same location.

ELASAK, Rex Glew, of Wairouru, N.Z., expects to be resident in Melbourne for about three years from a date in 1965. Rex will lift out a VK licence.

SAKSW, Ken KNUSS, is expected shortly. VK8YU presently on route to the island will serve two years in the area as a coastal radio operator.

SAKSW is in Saudi Arabia for a period of several years and activity is soon expected on a.s.b. with a beam. Expeditions to neighboring countries are also planned. His call will probably be 7Z3KKE.

The Spanish Broadcast Station EA7J, Radio Barcelona, is celebrating its 40th anniversary on 14th November, 1964. Amongst other celebrations is the award of a Diploma for Amateur operation. For Oceania the award may be earned by two contacts, any mode, with RT stations who must be situated in Barcelona, Terragona, Lerida or Gerona. Contacts should take between 1st June and 30th November 1964. Award is 200 available to a.s.b. Full information from this Bureau or from EA3GJ.

QSL traffic through the Bureau nosedived steeply during July when only 3,000 cards were handled.

—B. Jones, VK3RJ, Manager.

money but few had brought sufficient to purchase some of the exotic items of gear which were on offer. Gordon ZK3G, a quiet man at heart, became a fiend when the auction is in progress, especially when he holds the hammer. As a result, many were the rude remarks passed to poor but honest members with only the humble thirty bob for their persons. Bill, all who attended, and there were forty-three all told, enjoyed the entertainment and some of the gear went away in different hands from those which brought it. Lionel ZCB was the lecturer for the night and he showed and explained the mystic workings of a receiver with crystal front-end just the sort for a.s.b. There are those among us who do not have to do any soldering and at least one clerical gent has found the string to the back of the lounge chair, finding a Swan Transceiver at its termination.

If you were not already aware, the Hunter Branch Convention is only about four weeks away and, as before, this will be a three-day affair. The festivities commence on Friday, 2nd October in the usual meeting place at the Tech. College when a constructional competition will be held. To enter members must be prepared to display and describe some item of home-built equipment which will not be shown previously at a Branch meeting. The committee is to decide which item deserves most praise and a handsome prize is offered to the successful candidate. Even if you cannot use a soldering iron, you must be able to eat, and persons with this ability are invited to do so. The evening will be spent at the Annual Dinner, to be held on Saturday, 3rd October, at the Prince of Wales Hotel, Merewether. The delicacies will be ready by 7.30 and the 200 and 100 mV. and 100 mV. folding pound per person. To make the whole business more interesting, this aforementioned event will be covered by a live relay on Sunday, 4th. This surely must be an encouragement to all the Macsutherlands and O'Halls to come to two events for the price of one. Those who wish to be a winning party will find a place at the same table as me will still have to pay the same amount for the Field Day only. With a couple of dollars more.

One of our YL Amateurs—and it should be easy to guess who, has been having some trouble with modulation when calling back to London at night. The fitting of a new valve cured the trouble (fact not knowing when a filament is not aligned). The 80 mc transmission from 2AKW is not well received in the local area of recent weeks and there has been a good deal of interference from ELs and interlate stations on the same frequency. It is hoped that the above difficulties there is a good signal on 1330 kc. free of interference and fading. Many of the local listeners use this frequency and all report good results. Because of the radio problems, the news from the v.h.f. outlet via ZK3G is now from tape, prepared prior to the broadcast. This has meant a much improved signal on 3 mHz.

It was pleasing to see so many of the Cemeck boys at the last meeting. Their club station 2CC has been on the air recently during the past few weeks with good results. However, the remark made by Sherwood, "See you on the air," was the funniest I have heard for some time. With something like him a tx so that he may carry out this threat.

David ZKXA has been notified of his success in the recent Morse test and he is now anxiously awaiting the issue of his full call which may even be on the air by the time you read these notes. As well as the new A.B.C. station ZJTH, there is a new station in the Upper Hunter, where call ZCJW has been made. Some remarkable things with the rig and now has a super signal on 80. Frank ZFC also has chased the top of his range of his 5 x 5 mHz signal to many Jack ZAJY is reported to be considering a change of QTH and may be soon enough to attend the meeting. Paddy ZAXU has done some remarkable things with aerials and has a greatly improved rig. Membership at the Westlakes Radio Club has increased again and if all goes well, there must be a new batch of CQs at the end of the course. The transmitting station of the Club is now on the air and has had some fine reports. It is said that Henry ZAPL called CQ the other day and this may be a very good

omen. But on which will confound even the experts is the receipt of a card from Venezuela for 2AKK addressed VK3PMU (try 2AKK). Well, I ask you, am I as lucky as all that?

The September meeting, on 4th, will feature four lectures and should be of interest to all. Remember, Room 8, Classroom Block, Newcastle Technical College. See you there. 7A, 2AKK.

CENTRAL COAST ZONE

About 25 members and wives from the Gosford Radio Club had a most instructive tour round the Vales Point generating station recently and this was followed by a picnic lunch on the shores of Lake Macquarie. We saw several 360 megawatt power transformers which didn't take up overmuch room. However, the station up the voltage to 16 kv. to 230 kv. and that's a few volts! The place consumes 13 million tons of coal every year from highly-mechanized nearby collieries. Everything is covered by a belt of steel and it will need about seven staff when completed. Can you imagine electric precipitators working at 50 kv. and 100 mA? That would cause a bit of GRN if not shielded by a metal box, I would think. With all that power to spare don't you consider 150 watts is a bit light on

OBITUARY

VOL MOLESWORTH, VK3VO

It is with sincere regret that the VK3 Division announces the sudden passing of Vol Molewirth, VK3VO, who died at Prince Henry Hospital at the age of 39 years.

Vol was a Past President and Councillor of the N.S.W. Division and for the last three years was Secretary of the Disposals Committee.

Vol was a Master of Arts, Lecturer in Philosophy and Logic, Lecturer in Business Administration, and author of many papers on Philosophy and Logic.

To his sorrowing relatives we extend our deepest sympathy in their bereavement.

The club was grateful to Norm ZAJY for a lecture on v.f.o. stability, and a visit from two members of the V.h.f. Group in Sydney. Our next lecture on "Undersea Cables and Repeaters" by a P.M.G. man should be very interesting. Len ZAMU has been working DX on 14 mc. from the shores of Tuggerah Lake and plans for a beam are being laid. Frank ZACQ is retiring to Umina in the near future—it will be lovely to have the chief of slow-morse transmissions with us. It will be within shooting distance of Ron ZRVL. Bill Long, Harry ZLX is continuing the contacts with Antarctica. His YAZJ and wind-up tower makes things very easy. The 80 mc. beam has been showing some long-skip conditions resembling 40 metres lately. To work into Newcastle (40 miles distant) requires the use

HUNTER BRANCH

CONVENTION

2nd, 3rd & 4th October

- ★ Constructional competition.
- ★ Annual Dinner at Prince of Wales Hotel, Merewether.

- ★ Field Day at Marwong Point, Lake Macquarie, comprising Scramble, Tx Hunts, Launch Trip, in fact something for everyone at VKs most popular Convention.

Full details in the September Bulletin.

NEW SOUTH WALES

HUNTER BRANCH

Here is a warning to all those who would attend an auction sale. Take more than thirty shillings with you. It seems that it is not the thing to keep bidding when this is all the cash in one's possession. It certainly was the case at the August meeting of the Branch, where the winner of the Technical Contest Members had been warned to bring their

SILENT KEY

It is with deep regret that we record the passing of:—

VK2VO—Vol Molewirth
VK3JE—W. (Bill) Alder.
VK3NZ—R. H. (Bob) Hall.

of 100 metres on some nights. This must certainly be near the sunset minimum. Heard 2A2K and 2N2V on 100 the other night.

Wally 2A2X is back on 30 using an ATZ1. A couple of filters give complete freedom from f.v.i. One is a double half-wave 3.5 meg. tuned model incorporating three series-tuned traps for Channels 2. The other is a regular three section low-pass filter which commences at 24 megs. George 2A2DZ is having a spell in Concord House, but will whip up a speedy recovery. Phil 2ATX is planning a house on his Arcadian location and after that a beam antenna. Alex 2A2K and I will rejoice when the freeway into his orchard property is completed. At the moment the only free item is westerly wind and there's been too much of that. Antenna rotators and QSRV radiators are the chief sufferers.

Your scribe is searching for information on Dynatron indicators and their power supplies in preparation for use on the cubical quad. 73, DON

VICTORIA

WESTERN ZONE

Trev 3ATW, Warracknabeal, is on s.a.b. with a home-brew Hexxit. He has just taken to flying and has now approx. 30 hours up solo. Roy 3A0B, Telesnatzuk East, has also taken to the air. . . less GRM than on the air. The radio club at the Keith Area School is in operation once again after a temporary lapse due to a staff problem. The operation is only around the basic principles at the moment, with quite a bit of a.w.l. We have had gear on the air but have the f.v.i. problem, being on the fringe here. Hope to have representation at the next Convention Area with portable equipment for one or two school field days. Received a QSL from 4X4LN—no envelope, no stamps—a thought for the local authorities, free passage of all QSL traffic.

This sorbs was run out of Keith, kept on upsetting Bourke's Law trying to get on to the Wednesday night Zone hook-ups. New QTR is now leaving mid-way between Keith and the Coorong; only on 20v, but so f.v.i. Should be on 30 and 40 with 50w soon. Already on 20.5W Mc. mobile and a similar set-up on 3.6W Mc.

The members will regret the passing of Luke 6LL, who only a matter of weeks prior had asked me to pass on his best 73 to the Zone.

Tony 3ZAL, Bordertown, has done a magnificent job in building his own brick home although I understand he has a little harmonic problem lately. Hope to hear some more activity (redolent from this QTR. Not quite as fluent as Panfly, so best 73, Barry 5YB.

QUEENSLAND

DIVISIONAL COUNCIL NEWS

R.D. Trophy. Laurie 4ZGL reported that Chanderly Pty. Ltd., a large electrical organisation here in Queensland, had agreed to display the trophy in the display windows at all their branches. Various suburbs of Brisbane will be included and the trophy will be shown for about two weeks at their branch stores in the larger country towns. This should give most VKs a chance to see a tangible result of their efforts in the Contest last year.

New members are being approved at the rate of about seven per month. It is also apparent that many of the new members are from the country. Recently applications for membership of the W.I.A. have come from places as far afield as Rabaul and Port Moresby.

Peter 4PV gave a report on the Federal Convention and most of his report was printed in "QTC". Laurie 4ZGL has assumed the office of Federal Councillor and one of his first duties will be to arrange accommodation for the Federal Councilors and Observers from other Divisions who will be visiting Queensland for the next Convention.

JULY MONTHLY MEETING

Attendance figures for the monthly meetings have been very pleasing. Even though it has been winter (and we do have winter in the Sunshine State), 60 members attended the July meeting. Peter 4PV was asked to give a report on his trip to La Macedonia in VK3 where he attended a Civil Defence School. He was lavish in his praise of the accommodation and general routine of the school. When the meeting was closed and all general business had been dealt with, Vince 4VJ arose and with the assistance of Pat 4KB, gave an informative lecture on the antenna theory and practice. Most of the lecture was given in the dark while slides were being shown, but it was observed that every person present was so interested that no one tried to snatch forty winks during the evening!

IPSWICH DISTRICT RADIO CLUB

This Club seems to be one of the most progressive. Bill 1A001, the publicity officer, has been doing a fine job in sending news for inclusion in the Sunday morning broadcast from 4W1. At the first meeting for the year 1964-65 a patron and three vice-presidents were elected. One vice-president elected was the Mayor of Ipswich. Alderman Adams, who is a moral to this story and other clubs might take note. The Ipswich City Council supplies the members of the club with free QSL cards which, besides having the necessary information on one side, they have a full colour photo of the city of Ipswich on the other side.

The Club now has new rooms which are situated at the QTH of Warren 4QT. Warren has spacious room under his house and the work benches are well equipped with soldering

irons, drills, etc. This equipment is mainly used in conjunction with the A.O.C.P. classes that the Club conducts. The Club membership is now in the vicinity of 47 members. While on the subject of Ipswich, please don't ask Henry 4HC how many c.w. contacts he has had. Although Henry has been on the bands for a few years now, the answer to the question would be a positive integer which lies in value between zero and minus one.

QUEENSLAND YOUTH RADIO CLUBS

Regular news items from the Youth Radio Clubs have been published in "QTC" and frequent reference is made to the activities of the Clubs on 4W1. Most VKs will know what is going on in the State along the lines of the Youth Radio movement (i.e. if they read official Division publications).

So most of the following is for other interested persons and to let the southern boys know that the spirit of Youth Radio is very much alive here in Queensland. At the helm is Chas 4UC. Claude 4UX has undertaken the job of official examiner. Apart from Radio theory and practice, the club members seem to learn to run scavenger hunts.

One of the main problems with Y.R.S. clubs is obtaining all unwanted items of gear and components. Old copies of such publications as the A.R.R.L. Handbook are needed—in fact any of the other radio magazines which are no longer required would be very welcome. A supply of Elementary Certificates has arrived and have been inscribed and presented to those who are plotting the first Youth Radio Club certificates in VK4.

Enquiries are arriving from far afield about the Y.R.S. and a booklet with information on the scheme is available for those interested. Clubs have been formed at Wavell High, North Rockhampton High, Cairns High, Downsview, Gymnastic, Clearmont High, Padua College and the De La Salle College. Bob 4RW, perhaps you can explain the lack of Youth Radio Club activity in Townsville!

Sept there will be four transmitting Y.R.S. stations in VK4. ADS at the De La Salle College, has just begun transmission and naturally their first contact was with 4W1 on their opening day. At the same time, a station at the Redcliffe School on 11th and 15th July. An attractive feature was a backdrop board displaying QSL and Y.R.S. Certificates. Despite noisy conditions, contacts were made.

GENERAL NEWS

In the last issue of A.R.F. nearly every Division expressed a hope that they would win the R.D. Contest. If the large volume of publicity for the Contest here in Queensland is a result of this, then it is not hard to see how any other Division could possibly have a chance of taking the trophy away from us. Anyway, we hope the trophy is here to stay for a while but only time will tell.

Who is going to be first to hear 4WQ, the Bundaberg Amateur Radio Club Station? Back in July, the tx, AR1 and power supply were installed but the call sign has not been set yet. Incidentally, I believe Jim 4JV has had trouble with pigeon lofts, both here and in Melbourne. At a certain working day, Rusty 4JM acted

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Victorian Division

A.O.C.P. CLASS

commences

MONDAY, 19th OCT, 1964

Theory is held on Monday evenings, and Morse and Regulations on Thursday evenings from 8 to 10 p.m.

Persons desirous of being enrolled should communicate with—

Secretary W.I.A., Victorian Division, P.O. Box 36, East Melbourne (Phone: 41-3535, 10 a.m. to 8 p.m.), or the Class Manager on either of the above evenings.

as a capacitive coupling between the h.t. of the rx and the coil box. He assured those present at the meeting that the rx was working well as it definitely was pure d.c. going into the coil box!

For some time now, Council has been looking for a "QTC" Judge by what we have heard on the air, we have members who have the ability to talk with authority and who are not afraid to carry the "Amateur Radio" Show your skill at presenting Amateur Radio news to the members via "QTC". To those who are at all doubtful, "QTC" does not stand for Queensland and Council.

Jamboree-on-the-Air time will be around again in about a month's time. The July issue of "Queensland Scout" carried two pages on the jamboree. One page consisted of a map showing the interesting contacts made on the air last year. Who will be on the bands this year helping the Scouts along?

The 1984 Sunshine State Contest went off quite well in the morning but was apparently still slow in the afternoon. Council would like to hear your ideas on whether it may be a good idea to stop about noon next year. I see where Vince 4VJ and Al 4LT were looking over the "Amateur Radio" Camp "Karlings". It seems that they will be operating portable from this site during the Jamboree-on-the-Air.

I will close the news for this issue with an item on which should cheer up the people (and not end, if I wonder if he reads the news from other States?). Vince 4VJ and Reg 4VX well known 20 mhz. sidebanders have appeared on the air using that old-fashioned mode of telephony! I have to share SPB's thoughts on a.b.c. since I don't even own a radio. I have said and thought that "Amateur Radio" doesn't own a b.f.o. I would like to add that Bill collects and supplies all the news printed in this column under his name and I must say it is most readable form (and occasionally makes comments about a.s.b.). 73, 42BD.

TOWNSVILLE AND DISTRICT
Very pleasing to see in August "A.R." that the Publications Committee had published the July issue and that the circulation was 100. I only go to show that we all should watch the papers to see and note information that may be used to the best advantage in regards to our own Radio.
Certainly PanSy did not miss out in forecasting the latest trend in men's fashions, while our worthy Editor capped it off.

Only visitor from the south this month was Newton 4QW on a brief visit to the North to escape the rigours of the southern climate. Charlie 4BQ acted as official host and he was in the district, showing him all our latest industrial projects. Newton was awed by the large town in Charlie's backyard: first impression was that it was the new "Cairns" must! Charlie is hoping to work the world on 7 Mc. with the new quad he is constructing.

Hope to hear signals on the 10m band now that Bill 4ZBE and Don 4ZDM are back in town, having left the city of "sin, sweat and sorrow" Rockhampton. Sorry to report that the prominent 4ZG for the north. Alfie Westcott, is in hospital in Cairns with a severe bout of pneumonia, having been seen as a "hot cushion" all the weekend and he is on a tablet to plug the holes. Basil 4ZW, together with the rest of the locals there, are constant visitors. No truth in the statement that Basil intends keeping the receiver, says he is only keeping it in going condition.

Claude 4UK growing not enough time to play his bands, what with sitting in the super-techn, chair and plenty of overtime, hoping that the unreasonable weather will be kinder to the staff and the music store. He has been early to get the locals organised for the Scout Jamboree-on-the-Air in October and has ear-bashed all the locals to be on for "R.D." and make full use of the 10m band. Maurice examines the results and hears chaps on the air swapping numbers and fall to forward their logs (what a shame, it helps the other State win).

Notice lately the growing crowd of commercials on 14 Mc. some Sunday mornings. 20mK 4WV is running a "contest" can be heard testing with spots every 60 kc. from 14100 up to 14390 kc., and loud enough to wipe out the 20mK signal in the block-out. The frequency for the nice photo cover of "A.R." with four XYLs-their ranks are growing. Will soon have to hold their own against the "Mayday" I can get cups from Muriel! 73, 4RW.

SOUTH AUSTRALIA

The monthly general meeting for July of the VKS Division was held in the clubrooms on South Terrace to a somewhat smaller

gathering of members than is usual. The reason for the poorer than usual attendance is a bit hard to explain, certainly it was cold but by no means as cold and unpleasant as it has been this month, and it can only be presumed that the name of the speaker for the evening scared a few away. The guest speaker was Mr. Metcalfe, and his subject that of Xerography, and in case you might be tempted to think that I have descended to the use of bad language, I will repeat, Xerography, which, for the benefit of the persons such as myself, means Electrophotography. Now it is a peculiar fact, every once in a while we shake the perfect lecturer, the perfect lecturer, and the perfect subject, all of which adds up to a night of successful entertainment, even though the subject is only remotely connected with our hobby of radio, and believe it or not, we always manage to use these nights to have a smaller than usual attendance which is a matter of considerable loss to those who never turned up.

I would rate this lecture on Xerography as one of the best, if not the best, in all the years of our meeting nights, and no words of mine could ever do the lecturer or his subject full justice, or hope to convey on paper the intense and rapid attention of those members present during the entire one hour and quarter's practical demonstration of this interesting subject. Questions came quick and fast at the conclusion. QSL cards, circuit diagrams, R.D. Contest log sheets, and a variety of material were photographed and copied on the spot with a rapidity that had to be seen to be believed, and the night was brought to a close with most of those present in a somewhat spellbound condition. Brian 8TN proposed the vote of thanks to Mr. Metcalfe with a few well chosen words and the applause that greeted the lecturer must have been music to his ears. In fact his two tentative falter blushed with pleasure. All in all a winner, and once again I must say that those who stayed home missed the meeting out of a box.

Very little business was transacted, either Federal or Divisional, although the President, Phil 8NN, with what definitely looked like a leer in my direction, announced that Council had tentatively booked a holiday home, Melville House to wit, in National Park, Bealra, for the week-end of September 28 and 29, for the purpose of seeing the new television construction week-end on single sideband trans-

mission and reception for any who might be interested. This is something new as far as VKS is concerned and it will be interesting to see the interest and response displayed. Incidentally, it is proposed to build a transmitter at the camp and get it on the air on the Sunday at 1300 hours, and as this will be open house to visitors, the rest of the afternoon will be spent demonstrating a.s.b. DX, as that is what my instructions said. Remind me to set up my battery of Ford spark coils in opposition on 20 mxi!

Quite a gathering of old timers noticed at the meeting. Roy 8DA (Buck to you, Tony 8TL, John 8KX and that handsome, dextrous and athletic type SP7—oh well, perhaps won't go on—my national modesty has come to the fore!

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Heard Len SEF and Leith SLG having quite an interesting discussion as to why the plates of Leith's 80fs were being quashed with shame or mortification. I was not quite sure which. Leith remained quite unconcerned despite the obvious suggestions from Len and was apparently prepared for supernatural causes. Personally Leith, who reminded me of the old fire plug outside our once meeting place. Remember? Hi.

Len SEF had his private grizzle—it appears that the "Judge" had been turned off once or twice on a Sunday morning at his QTH, and he had been informed that it would be off again on the next Sunday—Len who signs the time book with the purveyors of the aforementioned "Judge", suggested that one or two people in the vicinity of Len's QTH were not paying their bills and this was a method of finding out who they were, with a possible bad ending for Len, met with the reception it was obviously deserved. In fact from a snarl on Len's transmission he was performing a fandango in series parallel on the shack floor.

I did not include Harry SMY in my list of oldtimers present at the meeting, mainly because he was dashing either and thither, scooping up the old shekels, and nobody would have

believed me that he was an oldtimer, going on the agile and youthful manner in which he was racing around the floor. Bad luck he won that modulation frenzy in a ballot—he has not been heard of since—in fact he has not been on—period.

Bob SNW, according to my usual reliable informant, is in the throes of house building. You see my dear friend, I have a lot of things of having the family castle re-decorated and re-furnished, to say nothing of knocked down and re-built, and this is enough for me. As far as the water down into the moat and the drawbridge breaks down and I have to empty the moat again to let the retainers return from the village, I am frustrated. I can assure you, to say nothing of the water rates.

The mentioning earlier of oldtimers reminds me that I heard two genuine oldtimers on 80 m recently in Bob SDG and Buck SDA. Their little chat gave me quite a few nostalgic memories—real old Amateur Radio at its best. In fact I did not hear them mention once anything about the square root of the hypotenuse of the zero base of the linear obtuse transistorised thingamajig. Quite a relief I can assure you!

Col SCJ also heard on 80 m recently. He seemed in good form and quite able to hold his own in any company. I was so happy to hear him say that his typewriter had broken down and can only hope it will soon be back in use. How Bob SCJ, I am sure, will hope to hear from you soon! Now, take it easy.

By the way, did you cop the photo of the "Holler than thou's" on the front page of the magazine in July? No price was mentioned on their heads but they were in luck to bring two gold, including the bull. What was the biggest blow to me, as I looked at the photo through the glass, was that I saw the way the VKs and the VKs were intermingling, and judging by the bemused looks on their faces, apparently enjoying it all. All my years of propaganda since up in smoke—the only redeeming feature being that Pincoff (IAFV) was not present. I will bet I took the photo. Another thing that annoyed me, two Comps SEF in the photo—as if one me, is not enough? You don't believe me? OK, I took the photo. The four blokes from the left in the back row I listed as Len SKM, but the old fool me—I know these VKs. Joking aside, it must have been a wonderful Convention at Hamilton, especially as it was not planned, it just happened. The only thing I have against it is that it was not an a.m. convention!—Incidentally, between you and me, it was the biggest I have ever seen since my XYL used my coherer for a salt shaker.

I had hardly posted last month's notes away when I received a letter from Uncle Tom STL, confirming the reported news that he was now down in the big smoke and was not residing at the Glencoe Industrial Estate, mainly because he was too old, or so he informed me. He is in the throes of getting back on the air and probably as this is being read is thumping the key and using the microphone, both together, trying to make up for lost time. Next work Tom, what did you do with your cabin?

Brian SCA displayed his recent purchase at the meeting, a pi coupler, with pardonable pride and enthusiasm, then left the room only to return and find the pi coupler missing in the land of the missing. His efforts to find the missing purchase became so frantic that the guest speaker, who was finally given up in despair and suggested that Brian was looking for an ash tray there was one on the end of the table! The pained and anguished face of Brian, as he sat there, was described as an ashtray was worth coming miles to see, and having found his recent purchase he vanished into the night, no more to return.

Noticed in a popular magazine published in VKs, which will remain anonymous—anonymous—well anyway it will remain a secret. I referred to the Divisional Council, the list of the office holders. Preparing myself and twisting the ends of my waxed moustache in anticipation of the names of the office holders, I noticed in print in such an illustrious publication, I was cut to the quick, and other places, to note that no mention whatsoever was made to the Divisional Council Officer, the Custodian of the Instruments, the Publicity Officer, the Magazine Scribe, the recipient of monies from the Divisional Council, to say nothing of Odd Job Man and Chief Interpreter at General Meetings. I can only assume that I am a failure. Just think of it, Publicity Officer could not manage to get my own name into print. Fix upon me. Some say "Good Old Pierce 2APQ"—"What do the mob say?" Good, let us not back SLG and in our thoughts toward our fellow hobbyists.

Some time ago I commented in these notes that the VK3 official station SWI must be something of a headache to the Council in view of the sad state of the 7 Mc. band, plus the uncertainty and newsworthy lack of organization being exhibited. A recognised axiom in this world is that if one criticises, one must also be prepared to improve. I will now view I now have no hesitation in throwing around oodles of praise for the overall organization and running of the session on Sunday 24th March. I am sure that the Council, equally shared by John SLV, Brian STN and Gary SKX, and the number of stations present, the uncertainty and newsworthy lack of organization of the present popularity of the station. No work fellows, you may all take a bow.

Throughout VK there are several public spirited Amateurs who conduct Morse code classes for the air force, for the benefit of those who want to secure their license. We salute these chaps for their unselfishness, but we certainly do not salute the occasional dills who come up on their frequency and carry out their on-the-air tests to the detriment of the listener who is struggling to copy the code. It is all right for the QRM maker, but already has a ticket, but what about the listener who has to sit back and twiddle his thumbs until the QRM ceases. Personally I could not think of anything to say to the offender, but I have a little thought on the part of the QRM maker could avoid the whole thing. Here's one: the offender will check the frequency of these codes and then the frequency of these codes and then the frequency of these codes. After all, most of it is only want of thought.

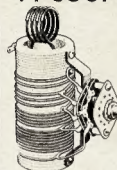
This month, in one way and another, has not been a good one for me. Returning from the place where I sign the time book with the chairman, I was told that the VK3 Divisional Council informed me that a letter from VK3 had arrived for me that day. Checking it with great care for three hours, I found a letter box constructors and other well known methods of extinction, I was amazed to find that it contained the annual report and balance sheet of the VK3 Divisional Council. The difference is being paid to an ex-VK3 President (if only for a short while) and I sit the hurried lamp in the middle of the night, I am back on the kerosene case to indulge in a little light and pleasurable reading. My feelings of pleasure were soon dispelled as I noted each day that the letter had gone to the trouble to underline with ink the name of Ken 3AFJ every time it appeared. I have seen the same name bob up so often in a report. It was like the Scarlet Pimpernel. I saw the name, I saw him there, I saw him there, I saw him there, I saw him there. I saw him the more my blood pressure rose. One statement I wish to refute, and I quote: "Ken Pincoff, VK3AFJ, was a member of the Committee and a Divisional Councillor, attended at his own expense, etc., etc." ad nauseam, ad nauseam. At his own expense is right. My indignation from a reliable source tells me that he rode a bike across to VK3 for the convention, and Joan and the Princess ran the way across alongside him, carrying the luggage. Well, that's what I was told anyway. At his own expense all right. All he needed was enough hot air to keep the wheels pumped up. Oh dear, oh dear, why do they send me these letters?

A few years ago I went to live at Henley Beach and the first winter spent there was admitted by the local inhabitants to be the worst ever recorded. I was told that the sea was so high that it was in the land of the missing. One of the locals told me, with his tongue in his cheek, that this was due to the sea taking it upon itself to express its annoyance at the sea and expressing its annoyance. Well, this winter has been one of the roughest for many years and the damage to the seafloor has been such that it is a warning to the sea. I tell you, I can only assume that the ex mayor of Lucindale, Arch SKX, has at last settled in at the seaside and is enjoying it. I don't argue Arch, these local identities know what they are talking about, and the sea is certainly a good judge of human nature and has definitely settled itself this time. And the same to you!

Noticed in the magazine, in the column of that old key-thumper Ray RHJ, Oh yes, I read that Ray was again in the hospital during the long winter? That should cause him to do a Fandango on his sleeping bag. Anyway I noticed that Jim BYC managed to stay in the hospital during the long winter. I never had the pleasure of meeting you at any time during your terms of office for VK3, but I have enjoyed your letters and your loyalty and hard work in the interests of our hobby in VK3. Take care of yourself OM.

Sneaked up to 80 m the other evening to test the new valve and the new QSO in search of some news, but like Mother

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Hubbard, the cupboard was bare. Have learned since that they now frequent 1.8 Mc. The broadcast band next, I suppose. You will never get away from me, but keep off 5DN!! I was that overcome last month to see the amount of mail VK3 is getting in the magazine that my conscience gave me a couple of severe twinges, and I have decided to write a couple of words less this time. [Quite obviously he cannot count above 10 unless he is barefoot!!—Ed.] Mind you, I should be getting the space—those boxes of cigarettes, those parcels of dried poultry, to say nothing of the eggs and pork that I have been sending over each month to Ye Ed have certainly cost me plenty. However, it is worth it for the Division, although I could not help but think that his "Wot no cheese?" in his last letter was laying it on a bit thick. After all, when the chassi-giver-awayer (I don't know who Ye Ed, he used to be satisfied with an occasional new motor car or so. OK, OK, you know what you can do with your annual supply £2DW and £2BK parked their cars in a well known parking area and what do you think happened. Doug locked his keys in his car and although Peter had his keys he could not unlock his doors. They then decided that Tom 6DP lived over the road and decided that they would call the people with the keys and from here they called the people who advertise "Reach for the Phone and the wrench." The idea being one was a member but the other was the ruler.

13, de 318—Parry to you—not you Fincott.

WESTERN AUSTRALIA

Here we are again in an attempt to compile some notes out of very little news. Everyone must realise that if you want notes to appear in "A.R." information must be passed on to your local club.

We must begin with some information which has been passed along and could be of interest to someone. Yesterday afternoon, 19th, a supply £2DW and £2BK parked their cars in a well known parking area and what do you think happened. Doug locked his keys in his car and although Peter had his keys he could not unlock his doors. They then decided that Tom 6DP lived over the road and decided that they would call the people with the keys and from here they called the people who advertise "Reach for the Phone and the wrench." The idea being one was a member but the other was the ruler.

How long ago did we lose the lower two megacycles of the 6 metre band? This is a question that could be well asked by Allyn 6DM as he has not received the beacon on 53.00 Mc. and blamed his converter for not working. Floor Allyn, he was still tuning from 50 to 52 Mc. hopeful of hearing signals.

Sometimes the 6 metre band is busy. The States 6B £2DV is busy modifying a 6B2 to work on the VK3 f.m. net and is hopeful of journeying through that State later in the year.

At our last meeting we had a very distinguished visitor from Kalgoolie, 6DX. If you want to see your money's worth, if you need to do it, invite Bill along. His ability at vocal expression and command of the English language leaves nothing to the imagination. This includes Australian expression also.

It is just as well that Allyn, our Secretary, has not had the phone in his residence because it could have become embarrassing to the Institute if someone had realised that the body with a kitchen chair in the public phone booth belonged to the VK3 Division. Of course the chair was necessary for two reasons: (1) Allyn is carrying a lot of weight these days; (2) If you can stop him from talking, let us know how!

The Youth Radio Scheme is progressing in this State with the formation of a group at Mandurah and Henry 6DC forming a group at Appierona. This scheme is a very commendable one and anyone who can assist

anywhere should contact Laurie 6CEA and he will use you somewhere in the scheme.

By this time the Remembrance Day Contest will be over and we wonder who was successful. Can you read this and know that you helped this State by submitting a log?

Remember that your Council wants to help you and the Division so if you have any queries, information or complaints bring them along to them.

Seems that this uses up all information to hand this month, so what about passing some along for next month? —E.Y.

TASMANIA

Once again our Remembrance Day has come and gone. Hope you all enjoyed the week-end and did your share towards helping your Division. Remember though, your participation doesn't help us, it only helps if you don't get that log away to F.C.C. on time. So if you have not sent it off yet, what about doing it now?

Another of the fraternity is deserting VK7. Our North-West coasters, Basil 7HL, sets sail for a place called Spirit River (don't know what kind of spirit) in the second week of 14th August. One thing about it, after this winter in the "ABC" Isle, he should be acclimatised for a white Christmas. Basil, we'll miss you here, but we certainly wish you and yours everything you could wish yourself in your QTH. He doubt we will hear you on the bands at some stage, but the rounds of all Divisions and if it has not come your way already, I strongly urge you to see it. Most interesting and informative was the general opinion here.

Ted 7EARLBAR is not so good at time of writing, but we all hope he will soon be all right and will not come out of his boot of the mumps. (That's a kids' complaint—must be in his second childhood!) Bob TOM is interested in VK3 capital and will be back in the States in Jan 72Z and so John are planning three weeks in VK3 from 25th Aug—going over for his Dad's 70th birthday. Congratulations and many more returns. Mr. Nichols.

Our general meeting lecture for August was given by Len 7LE and was the postponed July lecture on "The Future of Long Distance Communication via the Satellite Ionisation Phenomena," and as is usual with one of Len's lectures, it was delivered with illustrations and thoroughness.

The question is often asked, "What constitutes an active Amateur?" A builder and experimenter, or a rag chewer who pounds the ether at every available opportunity? And I know there are two very divided schools of thought on the matter, but I think all would agree that an Amateur such as Len, who has studied this phenomena almost daily (except for a few unfortunate and brief periods) since the first Sputnik went up in 1957, yet only very occasionally puts a signal on the air, is a very active Amateur indeed—possibly one of the handful of people in the world who do such work. Good luck, Len, with this and future efforts you get into.

Believe we are to have a visit from Barry 5BS during the summer school holidays. Hope you meet up with a goodly number of us over here Barry. Also Arthur 5ZLRE will be heard on the 14.1 MHz TRX for three weeks starting November 1.

Gerdard 7GK is now active with a good c.w. signal, mainly on 20, but came back to lan 7ZZ after the broadcast on 40 the other week-end.

Another signal heard by someone was YDB, who popped up 147.1 Mc. in the second week of 14 years. Could be some others about to be before long—that's if they pass the Sept. exam. Three 1 know, who are sitting are Barry 7RH, Robert 7Gees from Soerenga and Bruce Kelly from N.W. Zone. Good luck each and hope the answers come easy to you. 73, 72AS.

NORTHERN ZONE

There was a poorer than usual attendance at the last meeting, the total being 13 which included two visitors, Don 7EAY and David Clayton. We hope you will both become Zone members. Unfortunately the taped lectures did not arrive for this meeting.

Ray 7BRK is recovering from his recent operation and will, we hope, be back to normal soon. Norm 7ZRG was heard on the bands after having returned from the States. He announced his wedding in the not-to-distant future. Congratulations to you and your XYL-to-be, Norm, from the Zone. A new station, 7ZGP, is now active on 10 mc, mainly at week-ends. 73, Leigh Pretty.

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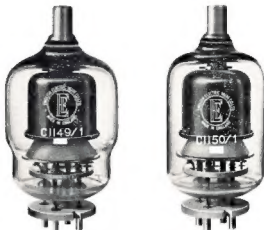
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Heater Current	2.15	2.15	A
Cathode Heating Time (Min.)	3.0	3.0	minutes
Mechanical			
Overall Length (max.)	6.00	6.00	inches
Overall Diameter (max.)	3.062	2.598	inches
Base	B4A	B4A	
Mounting position	Any	Any	

TYPICAL OPERATING CONDITIONS

	C1149/1	C1150/1	
Duty Cycle	0.001	0.001	
Pulse Length	2.0	2.0	μ sec
Anode Voltage	20	15	kV
Screen Voltage	1.25	1.25	kV
Grid Voltage	-600	-600	V
Pulse Positive Grid Voltage	150	100	V
Pulse Anode Current	18	15	A
Pulse Screen Current	1.7	2.0	A
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